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Intellect and Imagination

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Stanley Cavell
Leon N Cooper
Stephen Jay Gould
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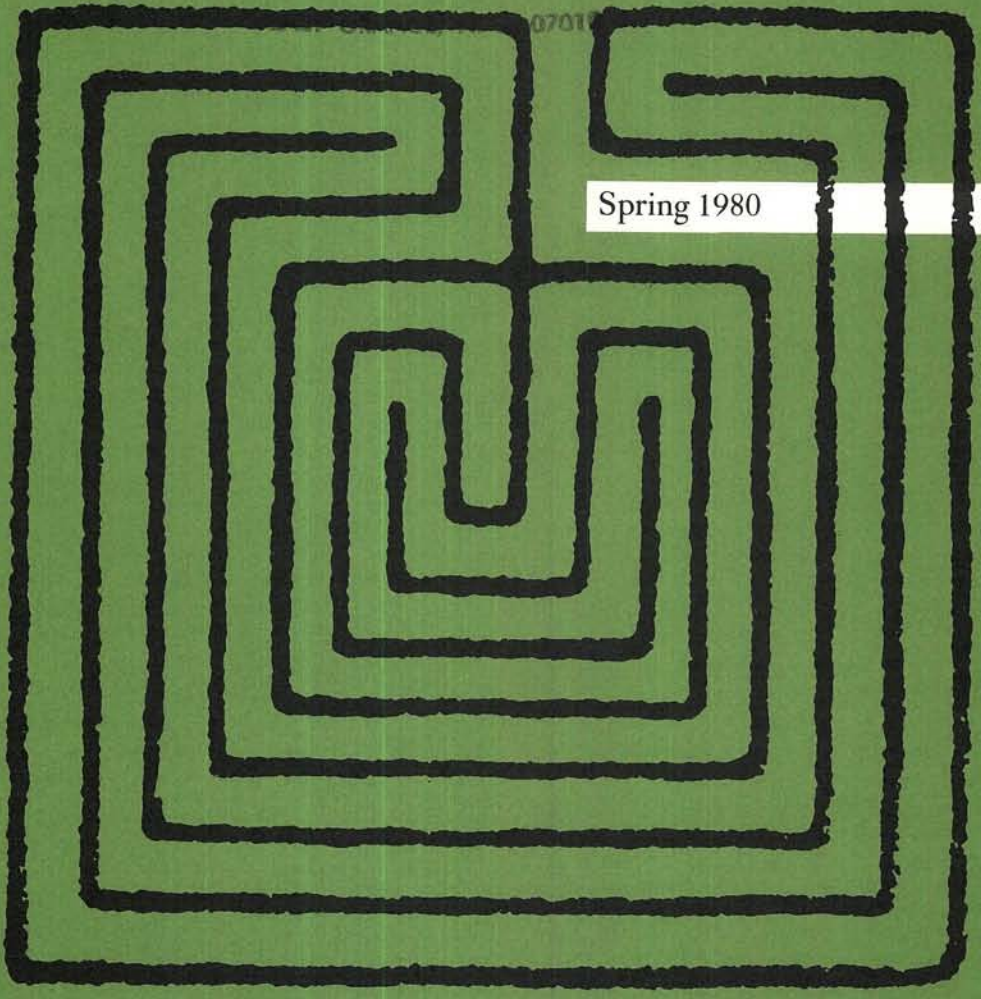

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Intellect and Imagination

The Limits and Presuppositions of Intellectual Inquiry

DÆDALUS

Journal of the American Academy of Arts and Sciences

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The Limits and Presuppositions of Intellectual Inquiry

v *Preface*

LEON N COOPER 1 *Source and Limits of Human Intellect*

KARL H. PRIBRAM 19 *The Role of Analogy in Transcending Limits in the Brain Sciences*

STEPHEN JAY GOULD 39 *The Evolutionary Biology of Constraint*

JUDITH N. SHKLAR 53 *Learning without Knowing*

JAMES A. BOON 73 *Comparative De-enlightenment: Paradox and Limits in the History of Ethnology*

WENDY DONIGER O'FLAHERTY 93 *Inside and Outside the Mouth of God: The Boundary between Myth and Reality*

MEREDITH SKURA 127 *Creativity: Transgressing the Limits of Consciousness*

STANLEY CAVELL 147 *Knowledge as Transgression: Mostly a Reading of* It Happened One Night

LEONARD B. MEYER 177 *Exploiting Limits: Creation, Archetypes, and Style Change*

LEO STEINBERG 207 *A Corner of the* Last Judgment

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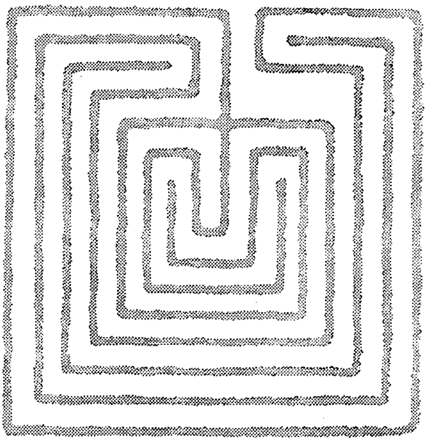

Preface to the Issue: Intellect and Imagination
The Limits and Presuppositions of Intellectual Inquiry

THE WORDS "INTELLECT AND IMAGINATION" have a fine resonance; taken alone their timbre is at once self-confident and assertive; they are clearly universal goods. Add to this, however, the subscription "The Limits and Presuppositions of Intellectual Inquiry," and the mood changes—a beguiling concept that seemed to soar, without impediment or control, becomes somewhat flattened, shackled, inhibited, constricted. Yet, both phrases are necessary for a faithful rendering of the contents of this issue of *Daedalus*. It is more than the merely contemporary preoccupation with the idea of "limits" increasingly fashionable in so many quarters that made the Editors and those who advised them survey a whole complex of epistemological problems that so obviously influence the character of modern scholarship and learning. This volume is more than a plea for realism; it is an argument for a more self-conscious probing of the conditions that govern our intellectual lives.

The story of the creation of this issue deserves to be told. Emory University, wishing to commemorate with a national conference what some might consider to be a purely local event, the establishment of a Phi Beta Kappa chapter on its campus half a century ago, planned a celebration that would appeal to Emory faculty and students, have meaning also for a larger Atlanta constituency, and resonate for those at a greater distance, unaffiliated with Emory but interested in the intellectual issues that such an occasion would raise. Because the models for intellectual observance are so few, and because Emory sought to make the event something more than a local happening, it may be useful to recount how the university came to settle on the theme that it did, and how *Daedalus* itself came to be involved in the enterprise.

The beginnings were simple enough; Emory created an interdisciplinary faculty committee charged with determining the intellectual content and the organizational procedures for its proposed observances. Since a committee representing every discipline in the university would have been wholly unwieldy, a reasonable representation of all the major academic interests was looked for. The humanities, social sciences, and natural sciences were necessarily involved; so, in the professions, were medicine, law, and theology. A committee that included representatives from English, Biochemistry, Economics, Anatomy, Religion, Sociology, Classics, and Art History had reason to claim an interdisciplinary character. The group, meeting regularly for well over a year, was very early persuaded that the subject of the proposed symposium had to be one that would successfully engage the intellectual interests of scholars from all disciplines and professions, and that one of its principal objectives would be to encourage close inquiry into the intellectual conditions that influence contemporary scholarship. While there was no great interest in being controversial, there was also no incentive to be safe, bland, or orthodox.

When President James T. Laney of Emory wrote the Editor of *Daedalus* in June 1978, asking whether collaboration "in the planning and publication of the [Symposium] proceedings" might be arranged, *Daedalus* responded positively, for it had long been committed to the kind of inquiry that Emory was moving toward, and thus welcomed the opportunity to participate in such an endeavor. A visit by President Laney and Professor Robert DeHaan, the chairman of the Emory University Symposium Committee, to *Daedalus*, followed closely by the Editor's visit to Emory to meet with the full Committee, confirmed that the prospects for collaboration were indeed excellent. The two groups working together were in a position to create an occasion (indeed, a set of occasions) significantly different from any that would occur if the two acted independently.

Emory's Symposium Committee had already proceeded to pose questions intimately related to others *Daedalus* had also begun to probe, however tentatively, in its two issues on "Discoveries and Interpretations: Studies in Contemporary Scholarship" (Summer and Fall 1977); these problems had also figured, though in a somewhat more narrow range of disciplines, in the *Daedalus* issue "Limits of Scientific Inquiry" (Spring 1978). That these matters could now be raised more explicitly, on a broader front, involving scholars from every corner of the scholarly labyrinth, was highly gratifying.

An intellectual occasion was fashioned that would be local and national, depending to some extent on resources in the Atlanta area, but relying also on the contributions of others who came from a distance. Evening plenary sessions for students, faculty, and others in Atlanta offered the promise of "magisterial" lectures. Round-table afternoon discussion meetings, with ample provision for audience participation, provided for another type of intellectual engagement, involving yet other individuals and interests. Finally, the presence of all the *Daedalus* authors in Atlanta offered the opportunity to meet in closed morning sessions to discuss the drafts of individual essays and to hear the criticisms of colleagues and others.

When we wrote inviting individuals to contribute to the Symposium, Professor DeHaan and I said:

> We envision a threefold focus of discussion within the larger theme. In the first of these we wish to examine the natural and biological limits on conceptualization. Here we have in mind all those questions concerning the brain, neural circuitry and physiology, artificial and animal intelligence, perception, memory, the subconscious, that may shed light on such organic limitations. Does the structure of the brain determine what we think? What are the relationships between animal, human, and machine intelligence? Are they comparable? How much does our genetic makeup influence our intellectual endeavors? . . .
>
> The second focus will deal with historical and cultural limits to inquiry. Under this theme we place those questions dealing with language, myth, economics, aesthetics, moral and other values, politics, urbanization, ethnicity, history, religion, and one's chosen discipline as limits. . . .

> The third focus within our general framework will be an attempt at redefining limits by creative interaction. Here we want consideration given to questions of the imagination and creativity, nonverbal communication, inexpressibility.

While neither of us—and certainly no one of our distinguished colleagues—would wish to claim that we exhausted the possibilities of our original agenda, we are impressed with the imagination shown by those who responded to our original invitation. The concern that brought us together—the idea that every intellectual discipline, that indeed all rational activity is bounded—is one that recurs constantly for us. We have tried to think through the meaning of these many boundaries. Again, quoting from our original letter, we asked whether such boundaries are set

> by the perversity of the physical universe and our apparent inability to probe its basically probabilistic nature; by the biological substratum of our neural circuitry and our ingrained mechanisms of information processing; by training associated with language, culture, history. But which of these limits . . . are real epistemological barriers beyond which sentient man cannot pass, and which are merely stumbling blocks of our own making, the products of ignorance, fear, or prejudgment? Can we change limits from restrictive boundaries to creative possibilities? How does the intellect surpass limits and in so doing redefine them?

The charge was difficult. It would be even more difficult to render in brief compass the arguments of those who have written for us. There is no need to do so; their views, nuanced, complex, original, are available in the pages that follow. They suggest why the issues raised are controversial and why they generate such heat and so many unconventional responses.

Leon Cooper is very explicit when he says, "Whatever limits there are to human imagination would seem to be those we have placed on ourselves by culture, training, and experience." In his celebration of what the brain sciences have managed to achieve in the quarter century 1950-1975, not least through reasoning by analogy, Karl Pribram comes close to expressing a comparable optimism, though it derives from quite different sources. The influence of the Emory Symposium on at least one of the participants, Stephen Gould, may be judged by his comment that he had come to the end of his original draft essay speculating principally about how culture serves to constrain. It was only the remarks of a fellow-author, Meredith Skura, that led him to realize that he had neglected to dwell also on how culture may facilitate. Gould, like others, is aware that the contemporary preoccupation with "limits"—so characteristic an intellectual feature of our time—is in itself no accident and requires explanation.

Judith Shklar, reflecting on "the recurrent attacks of paralyzing skepticism" that have periodically afflicted historians, considers both the Enlightenment and the nineteenth century, but writes also about our own times, with the recurring concern of so many historians to prove themselves useful. Her interpretations of modern democratic preoccupations accords admirably with James Boon's observation that "knowledge of other cultures and eras depends on the cultures and eras doing the knowing." This, Boon believes, is a saving knowledge that we ignore at our peril.

Responding to modern conditions that make the "impartial observer" seem an anachronism and that render many forms of skepticism unacceptable, Wendy O'Flaherty asks whether we must not look for reality in "our naked myths, the bare bones of human experience." If myth is indeed the "boundary line where fantasy and reality meet," as O'Flaherty suggests, there are of course new and compelling reasons for its study. Meredith Skura, in considering contemporary theories about creativity, shows how closely they confirm Greek myths, not least those that involve Daedalus, the great inventor and artificer. Still, psychoanalysis—to take only a single modern analytic example—does not simply repeat Greek learning; in important and significant ways it goes beyond classical explanation while also confirming it.

Stanley Cavell, asking without malice whether it makes any sense at all to speak of a "common cultural inheritance" today, as so many choose to do, writes about "the most famous blanket in the history of drama," the one that separated Clark Gable from Claudette Colbert in Hollywood's most successful 1934 film. Capra's *It Happened One Night*, Berlioz's *Symphony Fantastique*, and Michelangelo's *Last Judgment* are an unlikely trinity; they are the "documents" that Stanley Cavell, Leonard Meyer, and Leo Steinberg choose to interpret in this issue. That each of the interpretations is novel is the least of the contributions that are made. Each author, in dealing with his "masterpiece," forces us to ask again why sight, hearing, and comprehension are such underdeveloped human faculties. We are led to appreciate why the theme of intellect and imagination is so bewildering, a bog treacherous to any who are unwary, but filled with prospects for new understanding for those prepared to look and/or listen while avoiding many of the more conventional explanations that pretend to account for genius and creativity.

A very great debt is owed to Professor Robert L. DeHaan, who was so generous with his time and counsel over so long a period. He and his Emory colleagues made this issue of *Daedalus* a possibility. I would like to thank also all the members of the Emory Symposium Committee, Professors David Blumenthal, Hendrikus Boers, Alvin Boskoff, Rondo E. Cameron, Carl Hester, Kathleen Kelley, Clark V. Poling, Jonas B. Robitscher, W. Ronald Schuchard, and Alfred Wilhelmi. Thanks are due also to Professors Louis J. DeFelice, John Howett, and Kent Linville, all of Emory; also, Dr. Maurice Glicksman of Brown University, Dr. John Hines of the Georgia Institute of Technology, and Dr. Charles Magraw of the Boston Psychoanalytic Institute. They sat with the others as critics of earlier drafts of these essays. Tom Bertrand, Secretary of the University, helped all along the way; we are greatly beholden to him. So, also, are we to Mrs. Winifred Scherer.

The funding for this issue came principally from Emory University. The role of President Laney in securing these funds—indeed, in seeing the possibility of such a mutually advantageous collaboration—cannot be too highly praised. We feel a deep gratitude to him. Thanks are due also to the Lilly Endowment for its generous help in providing funds that made publication of these papers possible.

S.R.G.

LEON N COOPER

Source and Limits of Human Intellect

RECENTLY, VICTOR WEISSKOPF, a humane and learned man and one of the eminent scientists of our time, in a talk "The Frontiers and Limits of Science," stated optimistically that "at least potentially, science can justifiably claim the ability to understand every observable phenomenon." This statement was of course qualified: "there are many phenomena . . . that we do not yet understand. But . . . it is reasonable to predict that man will eventually understand all of nature scientifically."[1]

I was struck, however, with Professor Weisskopf's concern about the limits of science. "A Beethoven sonata," he says,

> is a natural phenomenon which can be analyzed physically by studying the vibrations in the air, as well as chemically, physiologically and psychologically by studying the processes at work in the brain of the listener. However, even if these processes are completely understood in scientific terms, this kind of analysis does not touch what we consider relevant and essential in a Beethoven sonata—the immediate and direct expression of the music. In the same way, one can understand a sunset or the stars in the night sky in a scientific way, but there is something about experiencing these phenomena that lies outside science.

Now, I know no one who would claim that a Beethoven sonata or, for that matter, a Carly Simon song could somehow be replaced by science. Yet, while I am not in disagreement with Professor Weisskopf when he says that "there is something about experiencing these phenomena that lies outside science," I am puzzled as to why this is a limitation on science. Rather, I suspect, this is an expression of a more general unease that scientific understanding, if it probes too deeply, can endanger some part of ourselves we regard as too precious to jeopardize, that the generality of such understanding may destroy the particularity of our experience, may lessen our ability to enjoy, or even to participate as human animals in, ordinary experience. And when we attempt to extend such understanding to our own selves, this unease becomes anxiety. It may be that we are so frightened of what we will (or will not) find if all is understood, that we are willing to deny the possibility that we can understand.

Not so long ago the eye was thought to be a somewhat miraculous organ functioning in a more prosaic body. We smile indulgently at the naiveté of our intellectual grandparents. Today, though we regard our eyes with great respect, few attribute magical properties to them. The same might be said for kidneys, the heart, and other organs. We appreciate their importance, we may understand how they work, we may not be able to build them as efficiently as nature does, yet we hardly regard them as mysterious.

The same calm does not seem to prevail when we consider the brain. Although the brain could be regarded in the same way we regard the heart, the eye, or a muscle, the functions associated with the physical entity "brain" such as thought, consciousness, and awareness of self—those most precious human characteristics—are not as easily attributed to the earthy material in which they may or may not originate, as the function of pumping might be attributed to heart.

The brain has not always been thought to be the physical origin of thought. Aristotle identified heart as the seat of intellect, assigning to brain the function of a cooling system. We are fond of dismissing Aristotle with an ironic smile; in his defense, however, we might note that, whether or not in any individual case the brain is used for thought, it always cools. Almost one third of a normal adult's energy (about 600 K calories/day) is used to power the brain. (Whether this varies with thinking is not known.) The dissipation of 600 K calories/day is accomplished by an enormous capillary network that functions, in fact, as a remarkable cooling system.

Let me quickly say that I am not in the camp of those who tell us with a sneer that we are constructed of only $1.05 worth of raw materials. (The price by now is surely substantially higher.) Rather, I would agree with Shakespeare:

> What a piece of work is a man! how noble in reason! how infinite in faculties! in form and movement how express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world, the paragon of animals![2]

Those who deny this show a meanness of mind that makes them ineligible for appointment to any humanities department; and, what may be more important, they deny the facts. Those who agree with the poet might conceal it to be granted tenure in the "hard" sciences. Worse, they often become immersed in a mysticism that embarrasses even their colleagues.

There is no difficulty "explaining" the marvel that is man by assuming the existence of a substance—called marvelous—a substance sometimes denoted today as a "holon," or in the past, as a vital force, responsible for his unique behavior. These are what I call "Coca-Cola theories." Like the homunculus of Goethe—the little man inside the large one—the secret syrup locked in a safe in a far-off country, its essence known only to a few high priests (who profit from it), is the mysterious substance that gives virtue and being to the whole. And all of these hidden substances may exist. We have no hard evidence to the contrary. It may be, as is sometimes claimed, that by their very complexity, large systems—in particular biological systems—attain an entirely new principle of operation (a law of nature, so to speak) that is intrinsically associated with their largeness and complexity. It may even be that a modification of the quantum theory is needed to provide a special place for consciousness.[3]

It was not possible to construct the nuclear atom with the concepts and materials available in classical mechanics and electrodynamics. But the effort was priceless, leading finally to the quantum theory. It has been possible to construct the gene from materials provided by chemistry and physics. We cannot say in advance whether the existing body of science is sufficient to encompass any new experience we encounter. However, the history of assumptions such as vital forces, distinctions between organic and inorganic, or celestial and earthy materials should be enough to warn us that grandiose and unwarranted assumptions often precede careful analysis of the implications of what already exists.

The object of scientific endeavor, as I understand it, is to construct from the materials and concepts (laws of nature, if we insist) provided by the physicist all of the entities of the world including brain and mind. We do not know if this will be possible. But evidence that it is *not* possible would be among the more important discoveries of science. If it is possible, all of the marvel that is a human being, the distinction between I and other, arises not from a new material or a new principle, but rather by an extraordinary organization of ordinary materials according to fundamental principles applicable in general to living and nonliving situations.

But what are the consequences and the implications for us if such explanation turns out to be possible? It is not an entirely comfortable prospect. The possibility that we can be explained, that we are constructed of dross and earthy material, that we contain no vaporous celestial substance, certainly makes us uneasy. Perhaps it is this that is troubling Weisskopf. Does removing the mystery destroy something precious? Does explanation destroy enjoyment? What is there "about experiencing these phenomena that lies outside science" ?

We must, of course, distinguish science as observation and explanation from experience itself. Knowledge and understanding, even understanding of experience in terms of physical phenomena, is not a substitute for the experience itself (as Goethe tells us in the first few lines of Faust), for experience involves nerve endings as well as the brain, whereas understanding engages the brain alone. This, it seems to me, is certainly not a limitation on science, nor should it be shocking or disappointing. We can enjoy wine and food even in the possession of a complete knowledge of the chemistry of taste and digestion. Notre Dame is distinguished not by the quality of its stone and mortar but by the remarkable organization of these elements.

In this essay I will argue that humans can be thought of as a perhaps remarkable organization of earthy material and that a "scientific" understanding of what we are and how we function is possible. And it is just the limitation on human intellect and imagination implied by such a scientific understanding of precisely how we function that I should like to explore.

The essence of scientific understanding is contained for me in the following, probably apocryphal, story. Newton, not able to calculate the effects of forces the planets exert upon each other, could not be sure that the planetary orbits would be stable. It is said he suggested that these orbits might, on occasion, have to be corrected—as though each millenium God would adjust his watch, which ran a little slow. By the beginning of the nineteenth century, Laplace believed he had succeeded in calculating the effects of such perturbations and had demonstrated that the planetary orbits would be stable. Rather than running fast or slow, the watch ran precisely on time. When Laplace was introduced to Napoleon, the emperor asked the author of *Celestial Mechanics*, "And where is God in your system? " Laplace, we are told, answered, "*Je n'ai pas eu besoin de cette hypothèse.*"

We are struck with admiration. How perceptive of the emperor to ask just the right question. Perhaps politicians were better briefed in that time. And we are taken aback by the incredible arrogance of this great scientist—which for many is the arrogance of science itself. But we may miss the clear implication that, had Laplace needed the hypothesis, he possibly would have been willing to make it.

This story epitomizes theoretical science: one does not make a hypothesis one does not need. But, further, and often overlooked, there is no hypothesis one will not make if one *does* need it. What is required is that the hypothesis be well formed: we must know what it means. We must, as Galileo learned from his study of mathematics, "make what is said depend on what was said before."

Of course, scientists don't make revolutionary hypotheses every day. We work within a system that for the moment is accepted. This gives us a sense of the permanence of our assumptions, which, however, often is illusory. Even a cursory view of the history of late nineteenth and twentieth century physics shows clearly that physicists have been willing to assume whatever was necessary, no matter how revolutionary or shocking.

Little was dearer to the nineteenth century physicist than Newtonian mechanics and the wave theory of light. Yet, under the pressure of the new atomic phenomena, the assumptions underlying these theories were abandoned. Causality, a concept that underlies almost all of Western thinking, has been modified. David Hume had suggested that causality was not in the phenomena themselves but was a concept introduced to order our experience, the type of philosophical conjecture that elicits knowing smiles from working scientists. But, again, to bring order to phenomena in the atomic domain, the quantum theory—the twentieth century replacement for Newtonian mechanics—has taken us from a completely deterministic theory to one in which equal causes do not produce equal effects. What is possibly most incomprehensible is Einstein's redefinition of a time interval, a concept almost impossible to communicate, because the everyday definition of time is so embedded in our language and our early training. These developments are so recent, it seems surprising that any orthodoxy at all could develop. Yet, it takes less than a generation for quantum mechanics, renormalization theory, or whatever to become new gospel.

These revolutionary changes, perhaps because they came at a time when positivism was in vogue, became confused with the idea that physical theories must not contain quantities that are "unobservable." This is somewhat of a misconception. What Einstein, Heisenberg, and those other giants taught us is not that a physical theory cannot contain entities that are unobservable (the wave function, for example, is not in itself observable), but rather that a physical theory is *not required to mention or contain entities* if they are unobservable. If something cannot be experienced, there is no reason that it must be built into physical theory. It might be possible to build a broader class of theories without it.

It would be unreasonable, for example, to *require* that theory contain a wave function. In quantum theory the wave function is a means by which the theory is made to yield results that are comparable to observation. Another theory that yields results equally in agreement with observation would be equally acceptable. Forty years from now—not to speak of a century in the future—physics is unlikely to have the same shape or to be founded on the same assumptions we make now. We can reasonably expect that currently fashionable assumptions will be abandoned to be replaced by unexpected new ones. It is here that some of our problems with science arise, for there are many beliefs, concepts, or ideas dear to us that we wish to retain even though science does not need them to construct its theories. But science, like Laplace, is strict—it makes no assumptions unless they are necessary.

I have never been content with the often repeated emphasis on scientific method. Possibly there is some method in science that could be distinguished from the usual madness in everyday affairs, but this seems overdone. The scientific method exists less in working laboratories than in antiquated textbooks. What science does, for all its sophistication of technique and subtlety of thinking, is quite straightforward and is duplicated in a great variety of other human activities. First, science observes. Perhaps this conjures up visions of laboratories and devoted workers in white coats. No doubt laboratories and devoted research workers in white coats exist. But their purpose—to distinguish the world in which we live from all other possibilities of our fantasy or imagination—is as necessary for the detective or the plumber as the scientist. Once the so-called facts are assembled, it is the problem of theoretical science to provide a fabric, a theory, a set of relationships—in short, an explanation—that ties together every phenomenon with every other; a task also required of the plumber if he is to locate the origin of the leak, or the detective if he is to identify the criminal.

This quintessential activity—the construction of explanation—is not restricted to science. It seems more likely that the animals from which we descended have been concocting explanations even prior to their entry into that sacred classification "human." In *Heart of Darkness* Conrad tells of the partially educated savage whose job it was to fire up the boiler of a steamer going down the Congo: "He was useful because he had been instructed; and what he knew was this—that should the water in that transparent thing disappear, the evil spirit inside the boiler would get angry through the greatness of his thirst, and take a terrible vengeance."[4]

It is difficult not to smile. This is certainly not science, we say. Perhaps not, but it is explanation. And the desire and need for explanation is older than what we call science; I would say that the psychological necessity for explanation is one of the early prerequisites for science, and that this need for explanation is one of the built-in primitives of our mental apparatus. For humans refuse to accept a world without order; among the most ancient and honored of human occupations is the creation of order.

It is a common misconception that science is separated from the arts because science deals with fact or with information. "When the modern Prometheus searches for knowledge . . . he brings back . . . many candles of information" or

"At one end [of our experience] we have the hard, bright lights of science; here we find information."[5]

The scientist as observer is, of course, in some sense searching for the facts. I say "in some sense" because, in the absence of any theoretical preconception or organization, the so-called facts are almost meaningless. The full range of possible human experience is so large, the variety of ways of looking at the same events so diverse, that it is almost impossible to record our experience in any sensible way with no preconception as to what is significant, and these preconceptions often are the boldest strokes of organization.

Crucial questions take their meaning only in the context of the conventions and beliefs of the period in which they are formulated, one reason it is so important to teach science in its historical context. The results of the Michelson-Morley experiment,[6] for example, were startling in the light of the theoretical preconceptions that had evolved from Copernicus to Maxwell. Aristotle or Ptolemy would have greeted their results as self-evident, as more support for the well-known "fact" that the earth is at rest at the center of the universe.

Even if we could separate the mining of facts from the invention of theory, the view of science as information misses completely the most remarkable and, in a way, the most astonishing achievement of scientific thinking—that is, the creation of order, the organization of this so-called information. It is surprising that it can be done at all. It is surprising that, in some domains such as physics, mathematical structures of such compact elegance have been found and can be put into correspondence with experience. (One should add that hundreds, equally elegant, have been tried and did not succeed.) As Einstein expressed it, "The most incomprehensible thing about nature is that it is comprehensible."

The relation between our organization of experience and "the true organization" is much debated. Perhaps as science advances we come ever closer to what is truly the ordering of the world. I have nothing to add to the deep philosophical argument that engulfs this question. But it is evident that the actual orderings we now possess have been created and are not intrinsic to the phenomena. They are human inventions rather than the result of a mining operation, because the same "facts" are ordered in what must be called strikingly different fashion from one generation to the next.

The planetary orbits will be Keplerian ellipses whether we follow Newton, Schrödinger, or Einstein. The assumptions, meaning, implications, and interpretation are strikingly different, but the structure (in the domain of planetary orbits) is identical. What is constant in scientific theory is just such structural relations as those between inverse square forces (or their geometrical equivalent) and elliptical orbits. It is one reason that the interpretation, the "meaning," of a scientific theory comes last, for this can change entirely without modifying the structural relations.

Quantum electrodynamics provides us with an interesting contemporary example. The agreement between experimental observation and theoretical calculation for such quantities as the magnetic moment of the electron or the Lamb shift (a small shift in certain energy levels of atoms) must be regarded as incredible. Yet it is commonly thought that the axioms on which quantum electrodynamics is founded—or at least the methods of calculation—may be inconsistent. It seems very likely that these will be modified in the future; but the structural relations that lead to such agreement between theory and observation will remain valid (if approximate) forever.

Probing the source and nature of mind presents us with more than conceptual trauma. The brain is a complex and baffling instrument that has so far guarded its secrets well. It is composed of vast numbers of cells called neurons (10^{11} is an estimate commonly given for humans) held together, fed, and cleansed by various supporting structures, blood vessels, and glial ("glue") cells. It is thought that the information-processing and storage functions of the brain are accomplished by the neurons and that the other tissue is occupied primarily with housekeeping.

Speaking pictorially, neurons look somewhat like trees, and a network of neurons looks somewhat like layers of trees one on top of the other. Information in the form of electrical voltages and currents is transmitted from the axons (branches) of one layer of neurons to the dendrites (roots) of the next layer. The electrical information in the dendrites of a particular neuron is gathered together to produce a voltage across the cell body (the base of the tree), and this voltage determines the electrical signal sent along this neuron's axon (the trunk of the tree) to the ends of all of the axon branches. The ends of the axon branches are very close to the dendrites of the next layer of neurons; and the information contained in the electrical signal that reaches the tips of the axon branches of one neuron is transmitted chemically across the small spaces (the synaptic clefts) between the ends of the axon branches and the dendrite roots of the next neuron. This produces electrical voltages and currents in the dendrite roots, and the process is repeated. Thus the information flow continues.

Although the properties of individual neurons are relatively well understood, the manner in which large interacting networks of these nerve cells produce mental activity remains almost a complete mystery. This is due in part to the complexity of the central nervous systems of higher animals and to the great difficulty of observing these systems without destroying them. It also seems likely that higher central nervous system properties are of unusual subtlety involving small changes in the activities of large numbers of neurons.

The means, for example, by which large numbers of neurons can interact to perform such functions as storage and retrieval of information remains unknown. Many ways to store and retrieve information exist: filing cabinets, libraries, and computers. But the fact that an animal's memory is held in a living structure and is successfully utilized, even though the animal may have no idea where his memories are stored or how they are ordered, places special requirements on theory. Current computer memories, for example, are made of elements in which yes/no information is recorded and that can be recalled by addressing the location of an element. These computers perform sequences of elementary operations with incredible speed and accuracy, completely beyond the capability of living cells. A basic problem in understanding the organization of memory in a biological system is to understand how a vast quantity of information can be stored and recalled by a system composed of vulnerable and relatively unreliable elements, with no knowledge of how or where the information has been filed.

In recent years it has come to be believed that the storage of memory in an animal central nervous system is distributed rather than local (more like a hologram than a photograph), and that such distributed memory is stored over large regions of the neural network by small but coherent modifications of large numbers of synaptic junctions.[7] Neural networks have been constructed that can organize themselves in such a way that they acquire and store distributed memories. They display, on a primitive level, features such as recognition, association, and generalization, and suggest some of the mental behavior associated with animal memory and learning. The mechanisms employed seem to be plausible biologically and are not inconsistent with known neurophysiology. In addition, the networks that result seem to be a reasonable outcome of evolutionary development under the pressure of survival.[8] Although the concept of distributed transformations and memory storage is less familiar than that of local storage, distributed transformations have been discussed and analyzed, and some such transformations have probably already been observed in the central nervous system of a higher animal.[9]

It is now commonly believed that much of the learning, and resulting organization of the central nervous system, occurs owing to some kind of modification of the efficacy or strength of at least some of the synaptic junctions between neurons, thus altering the relation between presynaptic and postsynaptic potentials. It is known that small but coherent modifications of large numbers of synaptic junctions can result in distributed memories such as those mentioned above.

Although this is not the place to go into technical details of the neural networks that have been constructed, I should like to suggest some of the basic ideas.

In a distributed memory it is the simultaneous or near-simultaneous activities of many different neurons (the result of external or internal stimuli) that is of interest. Thus a large spatially distributed pattern of neuron discharges, each of which might not be very far from spontaneous activity, could contain important, if hard to detect, information.

Each neuron communicates electrically with one or many others. To illustrate some of the important features of such systems, consider the behavior of an idealized neural network that might be regarded as a model component of a nervous system. Consider a large number of neurons that are connected to some other large number of neurons, so that on the average all neurons are connected to many others.

The actual synaptic connections between one neuron and another are generally complex and redundant; let us idealize the network by replacing this multiplicity of synapses between axons and dendrites by a single ideal junction that summarizes logically the effect of all of the synaptic contacts between an incoming neuron to an outgoing neuron. For utter simplicity, imagine that each of the incoming neurons is connected to each of the outgoing neurons by a single ideal junction.

We may then regard the synaptic strengths of the ideal junctions as a transformation that takes us from the incoming neuron activities to the outgoing activities. This transforms the neural activities incoming into the neural activities outgoing. It is in such modifiable sets of synaptic junctions that the experience and memory of the system are proposed to be stored. In contrast with machine memory that is, at present, local (an event stored in a specific place and addressable by locality, requiring some equivalent of indices and files), animal memory is likely to be distributed and addressable by content or by association. In addition, for animals there need be no clear separation between memory and "logic."

Each synaptic junction stores some portion of the entire experience of the system, as reflected in the firing rates of the neurons connected to this junction. Each experience or association, however, is stored over the entire array of junctions. This is the essential meaning of a distributed memory: each event is stored over a large portion of the system, while at any particular local point many events are superimposed.

The fundamental problem posed by such a distributed memory is the address and accuracy of recall of the stored patterns. It has been shown that such nonlocal mappings can serve in a highly precise fashion as a memory that is content-addressable and in which "logic" is a result of association and an outcome of the nature of the memory itself.

In some circumstances a distributed memory might be "confused," in the sense that it will respond to new events as if they were seen before, if the new event is similar to ones that have been previously seen. It will "recognize" and "associate" events never, in fact, seen or associated before.

The memory will tend to categorize stimuli on the basis of the past history of the system. If the system has learned to identify many items sharing some common feature, some new item possessing this feature can eventually be recognized more strongly than any particular event actually presented. This, of course, is reminiscent of psychological properties called "generalization" or "abstraction." From such a point of view, generalization grows from the loss of detail of individual instances, a characteristic of distributed systems. Something like this seems to occur in a few psychological contexts where it can be checked.

We have here an explicit realization of what might loosely be called "animal logic"—which, of course, is not logic at all. Rather, what occurs might be described as the result of a built-in directive to "jump to conclusions." The associative memory by its nature goes from recognition of particular items, each possessing some common characteristic, to the recognition of the characteristic itself, which can be described in language, for example, as passing from particulars: cat^1, cat^2, cat^3—to the general: cat. How fast this step is taken depends on details of the system.

In addition to "errors" of recognition, the associative memory also makes errors of association. If, for example, all (or many) of the items of some class associate some particular item, a new event that is also in the class will not only be recognized, but will also associate as strongly as any of the items explicitly contained in the class.

If errors of recognition lead to the process described as going from particulars to the general, errors of association might be described as going from particulars to a universal: cat^1 meows, cat^2 meows, cat^3 meows → all cats meow.

There is, of course, no "justification" for this process. Whatever efficacy it has will depend on the order of the world in which the animal system finds itself. If the world is properly ordered, an animal system that "jumps to conclusions" in the sense above may be better able to adapt and react to the hazards of its environment, and thus survive. The animal-philosopher sophisticated enough to argue, "The tiger ate my friend but that does not allow me to conclude that he might want to eat me," might be a recent development whose survival depends on other less sophisticated animals who *do* jump to conclusions.

By a sequence of such transformations, a fabric of events and connections is woven that is rich as well as suggestive. We can see the possibility of a flow of electrical activity influenced both by internal distributed transformations and the external input. This flow is governed not only by direct associations (which can be explicitly learned), but also by indirect associations due to the overlapping of the mapped events. We can easily imagine situations arising in which direct access to an event, or a class of events, has been lost while the existence of this event or class of events influences the flow of electrical activity.

In constructing the means by which such mappings can be attained by a neural network in interaction with an environment, it has been necessary to utilize a distinction between forming an internal representation of events in the external world and producing a response to these events that is matched against what is expected or desired in the external world.

We use the idea that the internal electrical activity that in one mind signals the presence of an external event is not necessarily (or likely to be) the same electrical activity that signals the presence of the same event for another mind. There is nothing that requires that the same external event be transformed into the same neural patterns by different animals. What *is* required for eventual agreement between animals in their description of the external world is that the relation of the signals to each other and to events in the external world be the same.

Omitting technical details, what seems most important is that such neural networks can generate their own response to incoming patterns in such a way as to construct distributed transformations that can function as memories capable of recognition and association; and that to a limited extent these transformations can be regarded as internal representations of what has arrived from the outside world. The "logic" of the flow of electrical activity in such systems is a consequence of the interaction of the neural network, obeying rather general directives, with the particularity of the environment. These systems are self-assembling and require a minimum of prebuilt higher level mental structures.

We are some distance from an explicit theory for the physical basis of mental activity. But, surely, our thinking originates in the material in our head. Almost certainly, what we call thoughts or ideas are the play of electrical activity in neural networks. Very probably these networks modify themselves with experience to store memory. And, quite possibly, as has been implied, an underlying directive is to seek patterns, associations, connections in the external world—to jump to conclusions.

Obviously such a procedure is fraught with difficulties. Mistakes of observation and analysis will be made; but it is a procedure with survival value in a world that is sufficiently ordered, for in an ordered world it is advantageous for an animal to learn quickly and to act on what has been learned.[10] This animal can alter its behavior in days or minutes (rather than waiting generations for genetic changes) to adapt to different circumstances. Mistakes will be made, and these will sometimes be dangerous. But to the degree that the world is truly ordered, it is to our advantage to learn fast. If this is the primitive directive nature has given to brain, what are the implications for the knowledge it can achieve?

Surely one of man's oldest questions concerns the nature of knowledge. What is it? How do we acquire it? How can knowledge be distinguished from opinion or belief? How can "truth" be distinguished from "untruth"? These questions were asked by Socrates and Plato, and though we ask again, I do not think we will answer them here.

From the point of view of a strict empiricism, the attempt to go beyond sense data (without the introduction of assumptions or concepts not justified by the data themselves) seems to fail. Though it was surely a shock for the philosophical world to discover that the knowledge we want cannot be obtained purely empirically, this is not necessarily because nothing beyond sense data exists; rather, it seems reasonable to conclude that such a limitation on permissible assumptions is too rigid, that within such a limitation no construction is possible. It seems to me that this is a single example of the more general problem involving all scientific knowledge. Assumptions must be made (as Laplace, we make no more than we need), and the resulting structures judged by their coherence, consistency, elegance, and by their agreement, eventually, with sense data. The assumptions we do make—even the most primitive, those concerning space, time, and causality—need not be thought of as innately given or as due to some categorical imperative, but rather as assumptions introduced by a relatively unbiased mind to produce the most efficient ordering of the phenomena in the particular world in which we live.

The proposal that knowledge arises from a neural network interacting with an ordered environment can then be regarded as an attempt to construct a theory of the nature and limitations of human knowledge in a manner similar to the construction of theories in other domains. Such a theory with its assumptions and consequences forms a structure that is or is not in correspondence with our experience of knowledge itself. We therefore come to know the source and nature of knowledge in precisely the same way we come to know other phenomena. We judge theories of knowledge just as we judge other theories: by their consistency, explanatory power, and agreement with all manners of experience.

Since in such an approach we introduce entities that may or may not be directly observable, and these entities supposedly exist within the head, we can be accused of a sort of mentalism. But this, not by a misplaced positivism, is precisely how science progresses. Science has always constructed little machines or mechanisms "behind immediate experience" that connect various phenomena. The true "mechanism" of science is not a physical but a logical machine whose wheels and gears can be manipulated and that responds to pushes and pulls on the various levers in a consistent manner and in agreement with experience.

In an ordered environment the neural networks I have mentioned do to a certain extent form an internal representation of the external world (as has been demonstrated analytically and by computer simulation). Events that are common and associated in the external world are recognized (produce characteristic electrical activity) and associated in correspondence with what occurs in the world. These recognitions and associations are, it seems to me, the biological primitive of what we eventually call knowledge. Of course, the "knowledge" so gained is highly suspect; much of the time the generalization leapt to will be misleading or incorrect.

The painful and long schooling we are subjected to may be regarded as an attempt to discipline the built-in and somewhat freewheeling biological directive. Bertrand Russell once pointed out that we are born with belief. We must be trained to be skeptical. We see all about us and repeated over and over generalizations that are too quickly made, attempts to explain too much with too little. (These paragraphs may be an example.)

Conspiracy theories abound. It is sometimes more difficult for us to accept a single chance event than to concoct some incredible conspiracy to explain it. The discipline we impose on ourselves is directed, in part, to separating these somewhat fantastic concoctions from what we regard as legitimate theory. But there is no clean way to do it. Conspiracy theories can never be completely defeated, only made less plausible. And legitimate theories can never be shown to be "true" (nor can they be "falsified" any more than one can falsify conspiracy theories). They can only be made consistent, elegant, economical, and in agreement with observation.

If the source of human intellect is in such a piece of biological machinery—machinery directed by nature to act to aid survival, machinery whose use has been refined and perverted (as we have refined and perverted eating and sex), mental machinery that has often made body a slave to its demands—what, with this limited imperfect apparatus, so bounded in size, duration, accuracy, and speed, can we achieve?

There are obvious physical limits of intellect owing to the biology and chemistry of our mental apparatus. But these are rapidly being extended. The age of machine-assisted intellect has already dawned, and its outcome can hardly be guessed. Human limitations of memory, speed, accuracy, of computation, and of ability to catalog, recall, and compare are being, and will continue to be, dramatically extended. The electronic computer is for the mind what the bulldozer and steam hammer, in extending its range, power, and speed, are to the arm.

It therefore seems to me that limitations imposed on us by physical constraints on the machinery given to us by nature (while they may be significant when such ultimate physical limitations as the speed of light are encountered—somewhat remote at present) are not really the limitations that are of interest, since they can be extended by the use of machines to assist us.[11] Assuming that we are allowed essentially unlimited (machine-assisted) memory, speed of recall, and speed of sequential calculation, what are the limits of our intellect? Are there any situations for which order exists that we cannot penetrate to discover or comprehend that order? Is there any limit to our capacity for understanding?

A theory, an explanation, understanding comes about (at least as we visualize it as present) as a structure of relations connecting events; assumptions with consequences, forces with motion, motion with observed position, or forces with atomic orbits, with atomic transitions, with emitted (and observed) light, and so on. The full structure of even the accepted and classical theories is too complex to fit into any one mind at any given time. Although physicists would unanimously agree that the uranium atom with its ninety-two electrons is understood in principle, no one has come close to calculating completely all of the details. In such a situation the underlying rules (in this case the quantum theory and electrical forces), a few very well worked-out examples in complete agreement with experiment (the hydrogen atom), and a sense that the complex situations are understood (at least qualitatively—no surprises, nothing that does not seem to follow if we are willing to work in a straightforward manner) seems to satisfy us. And, indeed, if some aspect of the behavior of the uranium atom becomes of interest, a variety of techniques will be (in fact, have been) developed to obtain approximate solutions of the fundamental equations (consequences of the "fundamental rules").

We are much less comfortable if the fundamental rules are believed understood, and yet some qualitatively different phenomena cannot be seen to follow from the original rules. Such situations have occurred in physics: superfluidity and superconductivity, phase transitions and turbulence come immediately to mind. The first two turned out to be situations in which large systems displayed qualitatively new properties that were not easy to guess from the fundamental rules. In the case of turbulence, we seem to be entering into a new and intriguing area in which equations yield solutions that are more easily characterized as random (even though strictly speaking they are deterministic). This may be the case for weather prediction.

The great, outstanding biologically related problems concerning the human mind, consciousness, and self-awareness will, I believe, fall into a similar category—new, perhaps surprising qualitative properties of large and complex systems that follow rather easily (once we understand them) as consequences of fundamental biology and chemistry that is already in place.

But we might ask whether situations could arise in which even the rudimentary qualitative connections of the explanations are so complex that they cannot be seen or visualized by a human being; where, for example, an "explanation" exists only as a complex computer program, a program in which theorems are connected to others, not by a few simple rules, but by so many rules and conditions that we literally cannot see the interconnections between things beyond the fact that certain inputs produce certain outputs.

There can be no guarantee that explanations of the type we have come to expect will always be possible. Knowledge might exist that is essentially history, even more diverse and confusing than human history, with no rules at all. It might turn out that in some situations our "understanding" will be nothing more than a computer program. It may be that some phenomena are too complex ever to be understood in classical terms (perhaps economic behavior, social behavior, or the stock market). But the scientific enterprise is so young, so successful, and has shown itself to be so adaptable to different circumstances, that it seems somewhat premature to throw up one's hands and conclude that it will falter over what probably will turn out to be problems just a little more complex—involving just a few more elements to be handled at once—than the ones already solved. Had we done so with any of the recently solved problems in physics that seemed so intractable just a generation ago, some of the most beautiful results of the century might have eluded us.

A question of this type is just the one we are considering. Can a brain understand a brain? The answer to this seemingly paradoxical question is relatively simple. If we require 10^{11} rules or if we must follow the electrical activity in 10^{11} neurons in detail to understand a brain, we are unlikely to ever get such understanding into our present head. But if, as seems much more likely, the brain, as other biological systems, is organized by repetition and elaboration of a few fundamental principles, understanding not only can be had, but can be had in what we will regard as classical terms.

If there is a limit in this sense, it seems to me to be more one of interest than capacity. The scientific quest for understanding is often understanding of general relationships; when the situation is of more interest due to its complete uniqueness or individuality, "scientific" understanding does not become less possible but rather less interesting. It is perhaps this that most distinguishes science from the arts. An individual work of art is of interest for its particularity. For a work of art, how a thing is said is often more important than what is said; in science this is seldom, perhaps never, the case. There is very likely nothing about the experience of the Beethoven sonata that cannot be understood by science; but there is probably minimal interest in this understanding, since what is of interest is the individuality, the particularity of the experience rather than the generality of the understanding.

Putting aside essentially physical limitations, it seems to me that our intellect and understanding are bounded only by the limits of the structures we can invent, and that any limitation of intellect is a limitation of inventiveness or imagination. Is there a limit to human imagination or inventiveness? Is there a limit (other than physical) to the metaphoric, mathematical, scientific structures we can create?

It is an old and, I think, tired conjecture that certain ideas or concepts are built into our mental apparatus. It has been proposed at one time or another as far back as Plato's Meno that our notions of space, time, causality, or even that certain aspects of grammar are determined genetically. If such structures are built in genetically, they would of course be easier to learn, or perhaps to recall, but they would then be intrinsic limitations on intellect, since, being prebuilt, we could not discard or change them very easily. (Presumably some ideas or concepts could not be learned and thus would not be accessible to human intellect.)

This idea of built-in or innate mental concepts is old and occasionally reappears in high fashion. There is no way we can be sure, at present, whether or not such higher-level built-in structures exist. The notion is difficult to define precisely, since it is evident that our learning begins from some genetic initial state. The important question is precisely this: How structured is the genetic initial state? Does it include what might be called higher-level concepts, or are the so-called built-in concepts so primitive that they amount to little more than the possible arrangements between neurons or the possible strengths of synaptic junctions.[12] The strongest argument against such higher-level built-in concepts seems to me to be that they are premature and ill-defined.[13] Where they can be defined, concepts such as time, space, or geometry seem not to be built in but more easily explained as a consequence of the interaction of a relatively unbiased mental apparatus with some of the most basic ordering of our environment.

I suspect that, beyond such built-in primitives of the general nature of sucking, grasping, babbling, and a mental directive to "leap to conclusions," much of the rest is learned in interaction with the environment or explicitly taught. What evidence exists indicates that the general recognition and association capabilities of the neural network function with a minimum of bias and are as content to make one association as any other. The biological machinery has evolved in such a way as, so to speak, to be ready for anything. The apparatus that preserved us from predators on the grassy plains serve us as musicians and mathematicians. How we think is tempered and disciplined by training, not by nature.

A child seems willing to accept any connection, marvelous or trivial, if it is repeated and part of his world. No child of the television era questions the connection between the push of a button and the appearance of talking images on a screen. It would have been for science fiction to propose such a thing in the nineteenth century.

Whatever limits there are to human imagination would seem to be those we have placed on ourselves by culture, training, and experience. We live by the learned images and the myths in our heads; our imagination as well as our behavior is restricted by what has been learned. This seems to me to be the case even in those situations that seem superficially to be beyond human visualization: a fourth space dimension or Einstein's time. Mathematicians or physicists, of course, have no difficulty at all working with Einstein's time or any number of space dimensions. The problem for the layman (or even for mathematicians or physicists when they try to think in ordinary terms) is that visualization is taken to mean visualization in terms of concepts we have already learned, that we already have in our heads. Sometimes this is not possible. The new concept is independent of (or even contradictory to) the old.

Thus Einstein clocks and ordinary clocks cannot exist together (and both be given the name "clocks"). But we are not satisfied that something is time unless it is expressed in terms of ordinary clocks. If we are to visualize four-space dimensions, we insist that it be done using the limitations in visualizing three. We encounter a very similar problem when we try to visualize an unstoppable object and an immovable wall. We can see one, then the other, but not both together.

It also seems rather unlikely that anything is built-in to give us our notions of space (three-dimensional) or time. Rather, I would say that these deep and seemingly unbudgeable concepts are the result of the interaction of our relatively unbiased mental apparatus with some of the most elementary, repeated, and primitive orderings of the world we live in. I would conjecture that the same apparatus in a world of two or four spatial dimensions would quickly acquire the appropriate primitive notions. This comes close to occurring in actual experience. Engineers and physicists who design high-energy machines have developed a fingertip intuitive notion of Einstein's time and space that is applied as a matter of everyday routine in their work. Yet they switch without any apparent mental anguish to ordinary concepts of space and time before they reach home.

It pleases my natural optimism to be able to conclude that in this most important respect—imagination—there is no limit to human intellect. Our imagination is marvelously free, capable of any juxtaposition, unbounded by logic or even by experience.[14] Those physical limits to our intellect such as small and inaccurate memory, slow speed of computation, and so on can and will be increased almost without bound (or at least until the limits due to physical laws such as the speed of light intervene), so that one day we may regard them as irrelevant as we now regard physical limitations of our strength. The conceptual limits we feel so painfully are not those of nature but (just as for social behavior) those of training. They are there not because of how our heads are made but by what circumstances and education have put in them. Understanding and use of new concepts or ideas requires retraining the old generation, or (better) different training for the new. What is required is a newborn head, not a newly designed head.

*It also seems to me that the brain we possess is very likely capable of achiev*ing understanding of its own construction and function; that this poses no threat to our humanness if we remind ourselves that such understanding is no substitute for experience itself. It is the interaction of brain and body with the outside world that shapes them both; what brain understands does not replace the sensations it receives. There is surely something about experiencing a Beethoven sonata that lies outside science. But there is nothing about the experience that cannot be understood by science.

Although we no doubt will find ourselves to be made of ordinary materials, we might still marvel at their incredible organization. Although the entire universe might be determined, there is room for our creativity and for our individuality. What we call "I," the precious individual "I," is a result of genetic direction of the materials of which our bodies are constructed, in particular the few billion neurons protected by our skull, interacting via the sensory and motor apparatus with all of the vagaries of the environment in which we find ourselves, a precious particular consequence of universal or general "laws." The result is a completely unique object. There is no wiring diagram anywhere in the universe for what is contained in any individual head. Each head, each person, is completely individual in a sense as profound as anyone has imagined. There is no replacement for the individual experience that shapes every person. When an individual dies, he or she is lost irretrievably.

I am reminded of a distinguished physicist late in his career who was asked if he would like to be cloned. He thought he would rather not, since much of his highly successful career he felt was due to a series of happy accidents unlikely to be reproduced. "Suppose you were cloned and all the accidents were reproduced as well?" He declined again—"That would be boring."

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[2]Shakespeare, *Hamlet,* Act II, sc. ii, lines 319-323.

[3]In "How Possible Becomes Actual in the Quantum Theory," *Proceedings of the American Philosophical Society,* 120 (1) (1976), I have argued that this is not necessary.

[4]Joseph Conrad, *Heart of Darkness* (New York: Bantam Books, 1910) p. 61.

[5]Theodore Roszak, "The Monster and the Titan: Science, Knowledge and Gnosis," *Daedalus,* Summer 1974, pp. 17-32.

[6] The Michelson-Morley experiment was a measurement of the speed of light in various directions on the surface of the earth. According to conventional nineteenth century ideas, since the earth was presumably moving through the medium with respect to which light propagates, the speed of light as measured on earth should vary depending on its direction. However, first Michelson, and then Michelson with Morley, could find no such variation. The simplest conclusion might have been that in fact the earth was at rest (in the center of the universe?). However, it is a conclusion not leapt to by many. Michelson, not content with this sensational but negative result, turned his attention to other matters. And Einstein may not have been aware of this result when he conceived and wrote his 1905 paper.

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[8] A more detailed discussion of some of these ideas is given in two recent articles: J. A. Anderson and L. N. Cooper, "Biological Organization of Memory," Pluriscience *Encyclopaedia Universalis* (France, 1978), pp. 168-175. L. N. Cooper, "Distributed Memory Storage in the Central Nervous System: Possible Test of Assumptions in Visual Cortex," Cerebral Cortex Colloquium, Woods Hole, Massachusetts, April 29–May 4, 1979 (to be published).

[9] An example is a part of the brain related to the visual system known as superior colliculus. (J. T. McIlwain, "Large Receptive Fields and Spatial Transformations in the Visual System," In *International Review of Physiology: Neurophysiology II*, Volume 10, R. Porter (ed.) (Baltimore: University Park Press, 1976). Although the neurons that lead to the colliculus form a very precise, fine-grained map, cells later in the system, physically a few millimeters below the very precise cells, respond to stimuli over a wide area of visual space. Thus we have the apparently paradoxical situation—which seems to be true of other parts of the brain as well—that great precision of response is generated by systems composed of cells that progressively show less and less selectivity as the motor output of the system is approached.

[10] Whether the world is truly ordered and whether this order will continue is related to the problem of induction. Can we go from N to N + 1? We do not have to answer this question. For our argument it is sufficient that our own experience was ordered in the past. We can show that it is highly improbable that no order existed in the past for at least some portion of our own experience.

[11] It is sometimes said that computers, since they process information, are different in nature from bulldozers, which move earth. It seems to me, however, that it is more appropriate to regard computers (at least as now constructed) as extensions of our own abilities, since they perform no single operation that we are not capable of doing ourselves.

[12] This is just a step from the very old question: selection versus instruction. Is what we have in our heads selected from a very large number of preexisting possibilities, or is it put together in interaction with the environment by instruction? The answer is obviously: both. The question becomes interesting only when the level of complexity of the elementary items from which the selection is to be made is specified. Let me give an example. Is a novel written by selection or instruction? Usually we would say by instruction. But the selectionist could argue that each letter, including punctuation and blanks, that forms the sequence that makes the entire story has been selected from, let us say, a hundred possibilities, so that a novel consisting of a million letters has been selected from the 100^{10^6} possibilities.

[13] The problem is trivialized when one introduces assumptions of higher-level built-in mental structures before one has fully explored the consequences of far simpler, more general structures that we already know exist. Perhaps we might profit from some recent history. In theoretical physics in the last few generations many radical new assumptions have been introduced in attempts to resolve very difficult fundamental questions. Almost all of these have turned out to be unnecessary. Much of the remarkable progress that has been made in the last forty years has been the result of very careful and often brilliant working out of the rich consequences of assumptions already in place.

[14] Fantasy might be regarded as just such juxtapositions, a melange of various actual or created elements of our memory, fueled by desire and, at its freest, liberated from the constraints of logic or reality. Nothing is more shattering for fantasy than the mental intrusion of such constraint.

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The Role of Analogy in Transcending Limits in the Brain Sciences

IT IS 1980 AND ONLY TWO DECADES before the turn of the millennium. I wonder whether the term "limits" in the subtitle of this symposium reflects the recurrent fear humanity expresses as it approaches millennial transitions. The last two decades have been populated by prophets of doom who reflect in a more sophisticated way the projections of the end of the world rampant in the years 975-1000.

During these past decades I have been fortunate to participate in the unprecedented growth of knowledge about the human brain and how it makes possible human behavior and even human experience. Thus, I find it difficult to entertain *any* notions of limits in my field of inquiry. To paraphrase Wittgenstein, "The limits of my brain" are the same as "the limits of my world." But, in fact, only logic is limited; the world of emotion and practice is limitless. Gödel in his famous "proof" showed that any self-contained logic cannot prove true or false—that is, meaningful. What he failed to point out is that truth and falsity *can* be established when such a logic addresses events or contexts outside itself.

Formal logic of the mathematical kind is a result of categorizing and of the image-making and information-processing abilities of the cerebral cortex of the brain. These abilities involve contextualizing processes that relate image, information, and logic to use. During the past quarter century studies of brain function have gone beyond logic derived from analysis of the nervous system and now include the results of discoveries in other fields: communication theory derived from the operation of telephone systems; control mechanisms as developed in cybernetics; information processing as performed by computer programs; and image processing as demonstrated optically. From these discoveries new reinterpretations of familiar data and ways to search for new data have developed.

The surge of understanding that has come to the brain sciences has been almost overwhelming. Can the human brain fruitfully inquire into its own thought processes? When our understanding is stretched, we are tempted to draw the line—in this instance to interpret recent history as a terminal flowering of Western thought. We could conclude that the brain, man's last frontier, has shown us man's limits. I prefer, however, to look on the latest expansions of brain science as another example of the horizons that can be penetrated when human brain meets human brain.

On the Use of Analogy

Over the past century our civilization has produced several inventions that have initiated novel modes of thought. Each invention has had extensive practical consequences that have altered our daily life. Perhaps as significant in the long run are the modes of thought that accompanied or initiated the inventions, for these modes of thought form the context, the matrix, of the future: novelty is conceived in familiarity; inventions flow from taking inventories.

This essay addresses the impact of the new modes of thought on conceptions of brain structure and function, especially in their relationship to thought processing. The essay is therefore an attempt to trace the manner in which human brains go about understanding themselves. Skeptics suggest that such understanding in any nontrivial sense is impossible. Here I argue that a certain kind of understanding can be achieved on the basis of past accomplishments.

The kind of understanding to be gained is what is usually called "scientific." When I listen to a symphony or feel the intimacies of a relationship or enjoy a good meal, I experience a sense of tacit understanding of the symphony, the interpersonal experience, the food before me. This sort of existential understanding can be complemented by the study of musical form and of the ear and auditory nervous system; the analysis of the constraints and freedoms in interpersonal relationships and the emotional and motivational makeup of the persons involved; or the caloric content and constituent composition of foods and their metabolism. Such knowledge does not detract from, and may even enhance, each of the existential processes described. It is clear, however, that existential understanding is essentially private, while scientific understanding is essentially and eminently shareable.

Once we distinguish between existential and scientific understanding we can see that the skeptics are indeed correct in doubting our ability to achieve an existential understanding of our own brains. Brain tissue is peculiar because, in contrast to other tissues, it is largely insensitive to probing even by neurosurgeons. We cannot, therefore, sense our brains as such. Only the brain's processes are accessible to experience. As an example, when the somatosensory area of the cortex is electrically stimulated, a sensation of tingling in the toes is produced; when the classical motor region is excited, the toes actually move. In epileptic patients, whole trains of remembered experiences can be elicited when the cortex of the temporal lobes of the brain is probed electrically. The patient never exclaims that he feels his brain. He simply feels, and that feeling is referred to those parts of "him" that make neuronal connections with the brain tissue under the probe.[1]

Yet, while the brain appears inaccessible to existential understanding, there seem to be no barriers to a scientific understanding. As in other scientific endeavors, such understanding comes from a propitious blend of the three modes of reasoning that guide research and provide some understanding of its results: the induction of principles from data; the deduction of logical relationships among principles; and reasoning by analogy, which attempts to place the relationships in a wider context. This essay is chiefly concerned with reasoning by analogy, because, as pointed out by C. S. Peirce,[2] innovation stems almost exclusively from the proper use of analogy. Induction systematizes the familiar;

deduction casts it into formal relationships. Reasoning by analogy, on the other hand, brings to bear on the familiar a new perspective derived from another realm of inquiry.

The use of analogy has been fruitful in the brain sciences from their beginning. Often the analogical thinking is implicit. Sometimes it is explicit, as when the brain is compared to a telephone switchboard or to the central processing unit (CPU) of a computer. In either case, the analogy provides a step in the understanding of how the human brain functions.

On the Telephone and Information Measurement

The contribution of telecommunications to brain science came in the form of techniques for measurement of the flow of signals. The contribution of Bell Laboratory's Claude Shannon and his collaborator Warren Weaver[3] is a landmark in the development of modern thinking. Shannon and Weaver developed a measure of signal patterns in impulses of energy transmitted over a given time in a limited communication channel, using a binary Boolian algebra as a base for that measure. Thus a BIT (*bi*nary dig*it*) of information was first conceived as a unit indicating the match between the signal patterns produced by a sender and those received at the other end of the communication channel. The measure of information related the number of possible understandings (alternatives) contained in the message to those that actually were understood by the receiver. When the number of alternatives or possibilities (uncertainties) had been reduced by half, one BIT of information was said to have been transmitted. Shannon and Weaver noted that such a measure was related to the idea of entropy. Entropy measures the disorder of a system. The idea is taken from thermodynamics where it is used to describe the efficiency (or inefficiency) with which energy is used by a machine. Measures of order in the use of energy and in the flow of information promised to yield interesting results when applied to other fields of inquiry.

But this line of thinking ran into difficulties. Shannon noted that the measure of information depends on the uncertainty (the number of alternatives) in a system. For him, the measures of information and entropy were positively correlated—more information implies greater entropy. However, others, like Brillouin,[4] pointed out that an increase in the measure of information involves uncertainty *reduction* and is therefore more appropriately related to the opposite of entropy. This view has become prevalent: information is now conceived as the measure of order, and entropy as the measure of disorder, of a system.

In the brain sciences the information measurement concepts became especially powerful in the hands of Warren McCulloch and his collaborators.[5] They described the brain as an organ where communication functioned both internally in the network of neurons and as a means of providing the order of external (psychological) communications between individuals.

The impact of these formulations has been paradoxical. On the one hand, the idea has taken root that a level of organization beyond that of electrical nerve impulses exists and can be dealt with in quantitative terms as "information." On the other, specific contributions of information measures to the understanding of brain function or to psychology have been meager. Ross Ashby, one of the foremost exponents of information measurement theory, has remarked that the strength of the theory does not lie in providing answers but in allowing the reformulation of questions in more precise terms.[6]

The concept of channel capacity is an example of the failure of information measurement theory to provide specific answers while sharpening the framing of questions. This concept was devised to handle the organization of energy patterns in fixed channels of limited capacity. But this is an oversimplification in brain science, because fixed channels of limited capacity do not exist in the brain,[7] nor do they operate in personal communication[8] where the context of transactions is continually influenced by information received. Neurological and psychological systems operate within flexible constraints that shift, expand, and contract, as they do, for instance, when attention becomes focused. It is a common mistake at present to attribute *all* processing limitations to restricted channel capacity.[9] Although central brain processing limitations are real,[10, 11] the idea of "competency,"[12, 13, 14] based on contextual structuring, or "*chunking*" as suggested by Miller,[15] Simon,[16] and Garner,[17] is more productive.

The move from a concept of a restricted channel capacity to the concept of a flexible competency capable of being "reprogrammed" to meet changing conditions heralds a shift from viewing the brain as a telephonelike system to regarding it as computerlike. Before taking up this shift we need to clarify another related problem plaguing the application of information measurement theory.

On the Thermostat, Feedback, and Cybernetic Control

Cybernetics, "the science of information and control,"[18] raises the new problem. Intuitively, we may feel that the greater the amount of information available to a system, the more precisely that system can be controlled. However, since information can be defined as a measure of the amount of uncertainty in a system (as suggested earlier), it would appear that the more information there is present in a system, the harder that system actually is to control.

The difficulty is resolvable. Shannon in his original paper distinguished between two types of information: the first reduces uncertainty; the second is concerned with repetitions. In a telephone communication disturbed by excessive noise, the receiver often shouts, "What did you say? I can't hear you. Please repeat." When the sender hears this, he will repeat the message. The effect of repetitions is to reduce noise and error, and can be measured separately from reducing the uncertainty contained in the original communication. Error reduction is accomplished by repetition, or redundancy, rather than by changing the structure of the communication. Since error-reducing signals were not an intrinsic part of uncertainty-reducing communications, they were of secondary concern to Shannon and Weaver. However, error-reducing signals are, as we shall see below, the critical operators in control systems.

The original idea behind cybernetic control systems is twofold: (1) the current state of a system can be compared with a desired state, and (2), the current state can be brought closer to the desired state through adjustments (repetitions) based on the magnitude of an "error signal" that denotes the discrepancy between the current state and the desired state. The process of adjustment that reduces the error signal is called "negative feedback."

Norbert Wiener in *Cybernetics*[19] notes the relationship between cybernetics and the concept of homeostasis. Homeostasis describes the maintenance of a constant internal environment in the body by compensatory mechanisms brought into play when shifts occur in chemical or physical conditions. The physiologist Cannon[20] had developed this concept extensively. Wiener included physiological homeostasis in the broader concept of control systems. The thermostat, which maintains a temperature within assigned limits, is an example of a control system.

The idea of physiological homeostasis played a role in the development of the more comprehensive ideas of cybernetics. The concept of negative feedback that developed out of control systems is, in turn, applicable to neurophysiology. In a sense, an engineering idea that was, in part, based on physiological observations returns to physiology on a higher level. Negative feedback is currently invoked to explain regulation by the brain of sensory input from the external environment[21] and the fine-tuning of muscle activity.[22, 23]

The first evidence of negative feedback in the operations of the nervous system came from work on muscle spindles, receptors in the muscles that signal the degree of muscle stretch.[24, 25] These muscle spindles are directly controlled from the spinal cord and brain, forming a loop that assures that movements are smooth and coordinated.

Feedback from the brain also regulates receptors of other sensory systems. Signals originating in the brain can alter the input of signals from tactile,[26] auditory,[27] olfactory,[28] and visual[29, 30] receptors. The association areas of the brain, which lie adjacent to the somatosensory cortex, are potential sources of these signals that influence sensory input.[31, 32, 33]

This evidence of central control over receptors revolutionized the concept of the reflex[34] in neurophysiology and thus affected the picture of the stimulus-response relationship that had dominated psychology for decades. No longer could the organism and its brain be thought of as a passive switchboard upon which environmental contingencies might play at will. A new, active image of a self-setting, homeostatically controlled organism that searched for and selectively accepted environmental events replaced the old passive stimulus-response image. Now, instead of responses elicited by discrete stimuli, as in the old physiology and psychology, the response was seen as initiating further nervous system activity that altered future responses. In biology, this change in thinking flourished in the studies of animal behavior known as ethology. In psychology, the change was reflected in an abandonment of stimulus-response learning theories in favor of the ideas of operant conditioning and cognitive conceptualization.[35]

The thermostat embodies these principles. The set point of the thermostat determines the level at which changes in temperature will be sensed by the system and regulates (starts and turns off) the operation of the furnace. Here, the operation of the furnace depends on temperature changes within chosen limits rather than on a simple on-off switch. Homeostatically controlled systems, like the thermostatically controlled furnace, provide a tremendous saving in memory load. Von Foerster[36] called this mechanism a "memory without record." There is no need to keep track of the vagaries and variabilities of the temperatures external to the system: the homeostatic system operates on the hottest summer days and in the coldest winter months. Only the deviations of temperature from the set point need be sensed.

Cybernetics attempted to combine the insights derived from telecommunications with those derived from servocontrol. As noted earlier, this created problems. Some of these were anticipated by Shannon[37] when he used the term *information* in two different technical senses, neither of which corresponds to the popular sense. As we have seen, in one technical sense information is a measure of the reduction of the number of alternative choices, that is, of uncertainty. In the second, information was used to denote a measure of the failure to reduce a discrepancy between two ongoing processes. But the distinction goes even deeper. The first measure specifies chiefly the complexity of a process. It can be precisely and quantitatively stated in bits. The second measure is an error signal that specifies little or nothing about complexity, but deals only with discrepancy and changes in discrepancy. Usually it is measured in continuous analogue terms, since it is *change* that is of central concern. As noted above, when digital measures are applied to this second kind of information, it is seen to be more akin to the concept "redundancy" than to the concept "information"! It is this redundant error signal that is the critical component of homeostatic mechanisms and is involved in the negative feedback process of cybernetic control systems.

Error signals, which specify changes in redundancy rather than in uncertainty, provide the link between cybernetic concepts and information measurement theory. Cybernetic systems use redundant error signals to maintain stability. They have little to do with "uncertainty" or complexity. Brain systems that operate solely on homeostatic principles are technically not information-processing systems in the sense of reducing or enhancing uncertainty. Information measurement theory is therefore not applicable to internal homeostasis and external sensory processing unless the homeostatic principle is supplemented in some way.

These ideas characterized the brain and behavioral sciences two decades ago and are detailed in *Plans and the Structure of Behavior*.[38] Roger Brown[39] rightly criticized this book for the homeostatic cast it shares with psychoanalytic theory.[40] The notion of "drives and habits" in Hullian stimulus-response psychology and Skinner's concept of the "conditionable operant"[41] share this slant. Even ethological formulations of "eliciting stimuli" and "action specific energies" are essentially modeled on the homeostatic principle.[42, 43, 44] But the capacity of homeostatic systems to alter their set points is implicit in all of these theories.[45] This capacity was emphasized by Waddington in his concept of homeorhesis: a flow toward an ever-changing set point rather than a return to a static stable one.[46] Homeorhetic systems are open, helical, future-oriented, feed-forward systems (as opposed to homeo*static* systems, which are closed loops) because the changes in set point can be programmed. In biological systems, prime examples of helical organizations are the DNAs that program development. Engineers have developed nonbiological programmable systems, the currently ubiquitous computers.

On Computers and Programming

Computers are information-processing devices that have been heralded as harbingers of the second industrial revolution, the revolution in the communication of information. This revolution can be compared with the communications revolution that occurred at the dawn of history with the invention of writing or, earlier, when linguistic communication between humans began. The current revolution depends largely on stepwise serial processing. Despite prodigious speed, serial processing is considerably less nimble than the brain's facility, which, as we shall see, is based to a large extent on parallel procedures carried out simultaneously. Nevertheless, as a model for brain activity, computer programming has produced two decades of intense research.[47, 48, 49, 50] More recently, the field of artificial intelligence has attempted to enhance computer capabilities by patterning computers after natural intelligence[51] or possible brain organizations.[52] What has generated such wide-sweeping changes in the way we view communication and computation?

Von Neumann contributed a major innovation by devising a system of lists in which each item in a list was prefixed by an address and suffixed by an instruction to proceed to another address. This system allowed any item in any list to be addressed by (follow) any other item and in turn to address (precede) any other item. Items and lists of items therefore became endowed with the capacity to address themselves (often after running through several other lists), called "recursiveness" in the jargon of programming. As Turing pointed out,[53] self-reflective programs endowed with recursiveness can locate any item stored in them and can associate any group of items. Such a network of lists is a far cry from the stimulus-response type of communication based on the model of the early simple telephone connection.

Structures embodying lists of the sort necessary for program construction have been shown to occur in the brain cortex. The cellular organization of the cerebral cortex of the brain shows both a vertical and a horizontal patterning. There are vertical columns of cells, perpendicular to the surface of the cortex, in which each cell responds to a different aspect of sensory input from a small group of receptor cells on the surface of the body, from a small area of the retina, for example. The columns can be thought of as lists containing items (the cells).[54, 55] The horizontal organization of the cortex reflects the arrangement of receptors on the surface of the body. The somatosensory area of the cerebral cortex, which lies directly behind the central fissure, receives sensory signals from the body surface projected in a pattern that mimics a tiny human figure, or "homunculus." The items (cells), therefore, also form horizontal lists. Interconnections between the cells in columns or arranged within a single horizontal layer enable the brain to interpret moving sensory signals. Thus some cells in the vertical lists show sensitivity to movement of the stimulus from one surface touch receptor to another. Movement in one direction can trigger the brain cells, while movement in another has no effect, a finding that can be interpreted as suggesting a set of prefixes and suffixes as in von Neumann's analysis.[56, 57] In the visual part of the cortex *each* cell (item) in the cortical column (list) appears to be endowed with such prefixes and suffixes. Most of these cells respond selectively to movement, direction, and even velocity changes,[58] which suggests a richer, more finely grained network of connections than is present in the somatosensory system.

Characterization of cortical cells of the brain as similar to items in a program list is often described as *feature analysis,* since each item represents one feature of a sensory input. In fact, the prevailing school of neurophysiological thinking currently favors the view that these cells are feature detectors,[59] that is, that each brain cell is uniquely responsive to one—and only one—feature. A competing view is that each cell has multiple selectivities and that its output is not unique to any one type of stimulus, as would be required of a feature detector. In the visual cortex, for example, a cell may select on the basis of the orientation of lines, their width and spacings, luminance, color, the direction of movement, the velocity of movement, and even the frequency of auditory tones.

It appears, therefore, that each cortical cell is a member of an associative network of cells (perhaps a set of list structures, as the evidence noted above would suggest) rather than a single feature detector. *Feature analysis* must therefore be a function of the entire network of cells that is addressed by the total pattern of sensory input. The brain thus differs from current computers in that the initial stages of processing occur simultaneously, that is, in parallel rather than serially. Feature analysis, therefore, results from pattern matching rather than from single feature detection. To return to an earlier analogy, the thermostat is a primitive pattern-matching device that "selects" deviations from a set point. It thus reduces the memory load that would otherwise be required to "detect" the occasion of each and every new temperature that required a response. An association of homeostatic devices, that is, columns of brain cells, thus can serve as pattern-matching devices that select features from the sensory input.

Even the concept of list structures of homeostatic devices does not solve all the problems raised by viewing the brain as an associative network of cells. Ashby[60] noted that such associative networks tend to be hyperstable and thus intolerably slow to modify; they seem to be unable to learn. To paraphrase Lashley,[61] even though one may be driven at times to consider such a model in the classroom, it should not be forgotten that one of the brain's distinguishing features is its capacity to learn. Two choices are open to the model-builder. He can ignore the evidence for homeostatic organization of the brain, as Mountcastle and Edelman have done in their proposal for a "degenerative" (a many-to-one mapping) model in which feedback becomes a secondary rather than a primary constituent.[62] He can also do as Ashby[63] and as Miller, Galanter, and I[64] have done—start with an associative net made up primarily of homeostatic elements and add constraints. These constraints are based on invariant properties of the stimulus. The structures within the brain that recognize invariant stimuli or test-operate-test-exit units (TOTES as Miller, Galanter, and I call them) cut the associative net into pieces (to paraphrase Ashby) and can be shown to be organized hierarchically.[65, 66, 67, 68] A definition of the "invariant properties," or features, of stimuli now becomes critical. Turvey[69] and Gibson[70] describe such properties as localized in the environment of the organism, while nativists (for example, Chomsky[71]) describe them as selected by the organism in the face of an environmental cornucopia. The computer model of brain structure and function suggests an intermediate stance. In a computer the selection of a workable program depends on a "good fit," a match between input and central processor. The brain's "central processor" may be considered to have become adapted during evolution to an ecological niche, and it should be possible to determine the "invariant properties" (features) of that niche that have effected the adaptation. But with as general purpose a computer as the human brain, the responsible environmental features may be as difficult to delimit as the specifications of the adapting mechanisms of the brain that are concerned with identifying these invariances.

On the Hologram and Pattern Analysis

Mechanisms of extracting invariances ("features") from sensory input have been of considerable interest to neuroscientists and psychologists. As we have seen, a brain cell organization based on an associative net with hierarchic constraints can serve as a useful model. Certain problems exist with this model. There is, for example, the need to postulate an analytic mechanism that is relatively sparing in its use of neurons so that invariance can be detected without invoking a "one neuron-one feature" equivalency. A successful model must also explain the speed and immediacy[72] with which perception occurs and its high resolving power.

Historically, three sorts of answers have been given to the question raised. At one extreme is the "feature detector," or "one neuron-one feature" answer, which, as noted above, is untenable in the light of currently available neurological evidence. This model can also be faulted from behavioral evidence.[73] At the other extreme is the model proposed by Wolfgang Köhler to account for the distortions of physically measured stimulation found in illusions. Köhler emphasized the configurational aspects of perception, and suggested that direct current (D.C.) fields result when sensory input arrives in cortical tissue. The low resolving power of the D.C. fields casts doubt on the efficacy of such machinery and its ability to account for texture perception. A series of experiments was therefore set up to test the issues involved. The results of these experiments showed: (1) D.C. shifts *did* accompany the desynchronization of the cortical electrical record (EEG) induced by sensory (visual and auditory) stimulation; (2) disruption of D.C. electrical activity by epileptogenic agents placed on, or injected into, the cortex failed to impair pattern perception; and (3) such disruption did impair learning. Subsequently, it was shown that imposing a cathodal (negative) D.C. polarization across the cortex would slow learning, while imposing anodal (positive) D.C. polarization would speed learning.[74] In short, direct current shifts in the cortex bias learning, not perception, and are thus unlikely candidates for the critical machinery of pattern perception.

Between the extremes of the "one neuron-one feature" (usually referred to as the "pontifical" or "grandfather" cell dogma) and the D.C. field theory, a pair of more moderate views has been proposed. Each of these stems from one of the extreme positions. Neurophysiologist Horace Barlow[75] has suggested that the idea of "one neuron-one feature" be dropped in favor of a set of cells that together can recognize a feature. This proposal is little different from that made by psychologist Donald Hebb,[76] who suggested that a cell assembly becomes constituted in response to sensory input. In these proposals "one neuron-one feature" is replaced by "one cell assembly-one feature." Barlow's and Hebb's proposals differ in that Barlow's cell assembly has a relatively fixed range of sensitivities—propensities to respond—while Hebb's "phase-sequenced" cell assemblies vary with respect to their constituent neurons and change with experience.

A quite different point of view was offered by Karl Lashley in his proposal that waves of activity are generated in the cortex by sensory input and that these waves interact to produce interference patterns. Lashley, however, did not develop his suggestion at either the neuronal or the perceptual level. He was attracted by the possibility suggested by Goldscheider[77] at the turn of the century that the brain's organization of the perceptual field might display some of the same characteristics as the organization of embryonic developments (Lashley was a zoologist by training).

In several works I have developed in detail the "interference pattern" model for brain function.[78, 79, 80] At the neuronal level, the model interprets electrical changes in the cell membranes of neurons on the far side of synapses (or interneuronal junctions) as constituting wave fronts. These electrical changes, known as "hyperpolarizations" and "depolarizations," are not themselves nerve impulses. Depolarizations increase the likelihood that a neuron will increase its generation of nerve impulses; hyperpolarizations decrease this likelihood. My proposal is somewhat similar to that made in quantum physics where the wave equation is treated as a vector based on the probability of occurrences of quantal events. The neural "quantal events" are those hyperpolarizations and depolarizations that, taken as a pattern occurring in an area of the cortex, can be described in terms of wave forms. These patterns of polarizations form microwaves. They are not to be confused with the macrowaves that compose the electroencephalogram (which do not have the resolving power necessary to account for the richness of texture of perception). The EEG wave forms reflect the sum of many microwave processes as well as any synchronized nerve impulse activity found within the field of a recording electrode.[81, 82, 83] Molecular storage, perhaps in the form of a conformational change in the proteins of the cell membranes at neuron-to-neuron synapses, is assumed to result from repetitions of particular microwave patterns.[84, 85]

At the perceptual level, the model implies that sensory input becomes encoded in synaptic membranes by microwave patterns in such a fashion that image reconstruction can be readily accomplished. This can be done by storing the Fourier or similar transform (see below) of a sensory signal (which involves storing the phase relationships as well as the intensity of the signal[86]) rather than representing it by simple point-to-point intensive dimensions. (Compare this to a movie of the ripples produced in a pond by a set of pebbles thrown in.) In order to read out an image from such a store, all that is necessary is to invoke the inverse transform (actually the identical mathematical operation in the Fourier procedure) to restore an image. (Compare this to running the movie of the pond surface backward until the pebbles reappear.)

Evidence has been accumulating for almost a century that such wave form descriptions of sensory processing are valid. Ohm (of Ohm's Law) suggested in 1843 that the auditory system operates as a frequency analyzer, perhaps according to Fourier principles. Fourier theory states that *any* pattern, no matter how complex, can be separated into a set of component sine waves, that is, a set of completely regular wave forms, each at a different frequency. Helmholtz developed Ohm's suggestion by a series of experiments that provided evidence that such separation takes place in the cochlea, the part of the inner ear where the sound receptors are located. Helmholtz proposed that the cochlea operates much like a piano keyboard, a proposal that was subsequently modified by Georg von Bekesy,[87] who demonstrated that the cochlea resembled more closely a stringed instrument brought to vibrate at specific frequencies. Nodes of excitation developing in the vibrating surface (the "strings") accounted for the piano-keyboardlike qualities described by Helmholtz.

Bekesy further developed his model by actually constructing a surface bearing five vibrators, which he placed on the forearm of a subject. The periods of vibration of the five vibrators could be adjusted so that the five showed a variety of phase relationships to one another. The phase relationship could be adjusted so that a single point of tactile excitation was perceived.[88] It was then shown that the cortical response evoked by such vibrations was also located in a single area: the pattern evoked resembled the perceptual response in its singleness rather than the multiplicity of the physical stimuli.[89] Somewhere between skin and cortex, inhibitory (hyperpolarizing) interactions among neurons had produced a transformation. Bekesy went on to show that by applying two such vibrator-bearing surfaces, one to each forearm, and once again making the appropriate adjustments of phase, the subject could be made to experience the point source alternately on one arm, then on the other, until, after some continued exposure, the source of stimulation was projected outward into space between the two arms. Bekesy noted that we ordinarily "project" our somatosensory experience to the end of writing and surgical instruments. The novelty in his experiments was the lack of solid physical continuity between the perceived source and the actual physical source. Stereophonic high-fidelity music systems are based on a similar principle: by appropriate phase adjustment, the sound is projected to a location between and forward of the acoustical speakers, away from the physical source of origin.

Over the last decade it has been shown that the visual system operates along similar principles in its processing of spatial patterns. In an elegant series of experiments, Fergus Campbell and John Robson[90] found anomalous responses to sets of gratings (sets of lines or bars) of various widths and spacings. The anomalies were reconciled when it was realized that the widths and spacings of the bars could be treated as having a frequency of alternation over space—that is, the width of bars and the distance between them formed a pattern that, when scanned, showed a frequency in the change from bar to spacing. The anomalous results were obtained when these "spatial frequencies" formed harmonics.

Currently, it has been shown that certain cells in the visual cortex encode such "spatial frequencies."[91, 92, 93] Most telling are the results of experiments pitting the standard neurophysiological hypothesis that these cortical cells are line (bar or edge) detectors against the hypothesis that they are selective of one or another band width of spatial frequency. DeValois showed that cortical cells were insensitive to bar width and that, when the bars were crossed with others in a pattern such as a plaid, the response of the cortical cells changed to reflect the total pattern. Specifically, each cortical cell was shown to be selectively sensitive to lines (gratings) oriented in a particular direction, a finding[94] that had been instrumental in generating the feature detector proposal. If the cells were operating as feature detectors, additions to the initial display pattern of lines should not alter the orientation in which the display has to be shown in order to match the selectivity of the cell. Additional lines in the pattern would be processed by additional units whose orientation matched that of the additional lines. If, on the other hand, the total pattern of the plaid was being processed by the brain cell, the orientation of the whole pattern would have to be altered to match the orientation of the major components of the Fourier (i.e., spatial frequency) transform of the pattern. DeValois performed a Fourier transform by computer on each plaid displayed. Such transforms showed radii at various angles from the original perpendicular pattern of the plaid. DeValois found that all plaid display patterns had to be rotated to bring these radii into line with the special selectivity for orientation of the brain cells. Furthermore, the rotation was exactly that (to the degree and the minute of visual arc) predicted by the proposal that the Fourier transform of the total plaid (and not its separate lines) is encoded.

There thus remains little doubt that descriptions of the quantal microwave form domain in the cortex are valid models of the processing of sensory stimuli in audition, touch, and vision. Such descriptions can also be compared to image formation in the processing devices called holograms. Holograms were so named by their inventor, Dennis Gabor, because each part of the hologram is representative of the whole. In a hologram each quantum of light acts much like a pebble thrown into a pond. The ripples from one pebble spread over the entire surface of the pond (the mathematical expression for this is in fact called a spread function—the Fourier transform is a prime example of such a function). If there are several separate pebbles, the ripples produced by one pebble will originate in a different location from those produced by another pebble. The result will be that the ripples will intersect and form interference patterns, with nodes where the ripples add, and sinks where they cancel. If the "ripples" are produced by light falling on film (instead of pebbles falling into water), the nodes can be captured as reductions of silver grains on the film. Note that the information from the impact of each pebble or light ray is spread over the "recording" surface; thus *each portion* of that surface can be seen as encoding the whole. And as noted earlier, performing the inverse Fourier transform reconstructs the image of the origin of that information. Thus the whole becomes enfolded in each portion of the hologram since each portion "contains" the spread of information over the entire image.

The principle of the hologram is different from the earlier Gestalt view that wholes develop properties in addition to the sum of their parts. The properties of holograms are expressed by the principle that "the whole is contained or enfolded in its parts," and the very notion of "parts" is altered, because parts of a hologram do not have what we think of as boundaries.

The properties of holograms that are important for brain function are: (1) the widespread distribution of information—a characteristic that can account for the failure of brain lesions to eradicate any specific memory trace (or engram);

(2) the tremendous storage capacity of the holographic domain and the ease with which information can be retrieved—the entire contents of the Library of Congress can currently be stored on holofische (microfilm recorded in holographic form), taking up no more space than is contained in an attaché case; (3) the capacity for associative recall that is inherent in holograms because of the coupling of separate inputs; and (4) the provision by this coupling of a powerful technique for correlating—cross-correlations and autocorrelations are accomplished almost instantaneously.

It is important to realize that holography is a mathematical invention and that its realization in optical systems through the use of laser beams is only one product of this particular branch of mathematics. Fourier transforms play a role in modern computer technology as in X-ray tomography and, as demonstrated by the evidence described above, in understanding the results obtained in experiments on brain function.

Let us return for a moment to the classes of neural models that have been proposed for perception. Recall that the quantal microwave model (i.e., of interference patterns, holography) derived from a dissatisfaction with both the "feature detector" and "cell assembly" theories. John[95] and Uttal[96] have also developed sophisticated statistical correlation models, which differ from the holographic model, however, in that they ignore the quantal microwave aspect of brain function. If the computer analogy of brain function is taken seriously, the most efficient manner of achieving statistical correlations is to transform the data (the sensory input, in the case of the nervous system) into the Fourier domain. There is thus a convergence of these models when they are followed to their logical and neurological conclusion: nerve impulses arriving at synaptic junctions are converted to postsynaptic depolarizations and hyperpolarizations, which can best be described as Fourier transforms of those impulses. Repetitions of impulse patterns result in information storage of as yet undetermined nature, possibly alterations in the cell membranes of neurons. Subsequent sensory stimuli are cross-correlated with the stored residual from former inputs, and the inverse transform of the results of the correlation form our perceptions. The perceptions are then projected away from the brain itself by appropriate phase relationships, as in Bekesy's experiments, in stereophonic sound equipment, and in holograms.

The fact that models involving patterns of quantal microwaves are valid for both brain function and holography does not, however, automatically assure the validity of the holographic hypothesis of brain function. There are important differences between the brain process and the optical information procedure. First, in an ordinary hologram the wave form is spread more or less over the entire surface of the film. In the brain each individual cortical cell reflects a particular pattern of depolarizations and hyperpolarizations on its postsynaptic membranes. If this is compared to wave form encoding in a hologram, it is seen that the cortical "hologram" must be a patchwork[97] in which the Fourier transform of any specific input pattern becomes encoded in an overlapping set of patches, each patch corresponding to the receptive field of a particular cortical neuron. But such composite holograms, called strip or multiplex holograms, are commonly employed to provide three-dimensional *moving* images.[98] The process of adding together strips representing Fourier transformed sections of space was invented by Bracewell[99] to compose a high resolution image of the heavens by radio astronomy. Pollen and Taylor[100] interpreted some of their neurophysiological results in terms of a strip hologram in which each elongated receptive field served as a strip in the total pattern. Thus the neural hologram, because of its patchwork nature, shows properties that are purely holographic (discussed below) as well as properties that are due to the spatial arrangement of the patches or strips. These spatial arrangements form the basis of the list structures described earlier and account for such nonholographic properties of perception as location and movement in the space and time domain.

Further, as noted earlier, each cortical cell is selective of several features of a stimulus. In the visual system these can include spatial frequency, color, directional movement, and velocity. Recordings from small groups of neurons in the visual cortex suggest that other aspects of situations are also encoded: in a problem-solving task, wave forms indicating the presence or absence of expected reinforcement are recorded.[101] The aspects of brain function that are encompassed by the neural holographic model are not exhaustive of all that the brain accomplishes, and the relationship of the model to the information and control models presented earlier must not be forgotten. The holographic model does, however, account for hitherto unexplained aspects of brain functioning, and it brings brain science into relationship with the revolution in modern physics occasioned by quantum and relativity theory.

This relationship to physics is brought out when a particularly vexing question is faced. In all of the holographic systems other than neural that have been described above, an observer is assumed. Who then, and where, is the observer of the image constructed by the neural hologram? Where is the little man in the head, who is the "I," the "self," that experiences the results of the holographic process?

To answer this question one must first ask what it is that is being observed. The assumption has been that an isomorphism (identical form) exists between a sensory perception and some physical "reality."[102] But, as the Bekesy experiment with multiple vibrators makes clear, physical reality and perceptual reality may differ substantially. The sensory apparatus appears to be lenslike as it focuses an input, but the focusing produces an image that is decomposed by subsequent neural activity into the Fourier transform domain—that is, into a distributed holographic form. In view of the invertability of *image domain* ⇄ *holographic domain*, one may ask in what form the input to the senses arrives? Is this input holographic in nature, and does it only become organized into images (thereby revealing the objects of which the images are formed) by the lenslike capabilities of our senses?

This view is probably too extreme. The only way we can answer these questions at present is through the evidence of the senses and the instruments devised to augment them. This evidence suggests an ordinary level of reality to which the senses have become adapted through evolution. "Ordinary reality" is the reality of Newton's mechanics and Euclid's geometry. It is grasped through consensual validation—by bringing to bear the several senses and inferring a reality that partakes of them all. We see a moon in the sky and send a man to palpate it. We bump into unseen obstacles and invent radar and sonar to discover them. As infants, we hear our mothers, and see and touch them. At another level, smell and taste are based on our perceptions of dissolved molecules —a chemical level of an unseen, unheard, and untouched reality.

More recently, physicists have probed ever smaller components and have taken a new look at the evidence about a spatially distant reality presumably palpable but beyond our reach. The evidence about this macrouniverse comes to us by way of the very same electromagnetic components that make up the microuniverse. It should come as no great surprise, therefore, that the laws that relate to us the nature of the macrouniverse, such as the special and general laws of relativity, and those that relate the nature of the microuniverse, that is, quantum and nuclear mechanics, provide a somewhat similar conception of reality. This reality, highly mathematical in nature, departs considerably from ordinary sensory experience.

David Bohm[103] has noted that, although the mathematics of relativity and of quantum theory are thoroughly worked out, the conceptual representation of what that mathematics might mean has lagged seriously. He suggested that this lag is owing to our propensity to use lens systems to construct our conceptual reality. He proposed that the hologram might provide a better conceptual model for understanding both the macrouniverse and microuniverse! His proposal strikes a responsive chord in the neuroscientist who also has found a level of organization in the nervous system that is more appropriately modeled by the hologram than by the senses (i.e., lenses). After all, the brain is a part of physical reality.

What are the characteristics of this holographlike order of reality? First, it does not correspond to sense perception and is thus counterintuitive. Second, this order—which Bohm calls "implicate" to distinguish it from the ordinary "explicate" sensory order—is nonobjective. The objective, explicate order is made up of the images by which we know objects. These images are constructed by lenses: the lenses and lenslike characteristics of our senses as well as the lenses, often called "objectives," of our microscopes and telescopes. By contrast, the holographlike implicate nonobjective reality is not composed of things but of quantally constituted microwaves and their interactive constituents such as constructive (nodal) and destructive interferences. Leibnitz described such a reality in his *Monadology*[104] in which the whole universe was represented in each monad, a windowless portion of the whole. Substitute lensless for windowless, and the monad becomes holographic.

Finally, in the reality described by the quantal microwave form domain, the ordinary dimensionality of space and time become enfolded (implicated), and a different set of dimensions becomes necessary in order to specify its characteristics. Time and space can be read out, but the readout may show peculiarities such as the complementary nature of measures of location in space and of moment (momentum), so that in specifying one, the other becomes elusive. "Particles" in this microuniverse appear to influence one another in situations where a causal connection between them cannot be traced.[105] An implicate order composed of the probabilities of appearance and disappearance of interactive nodes, related by their wave equations, was proposed to account for the peculiarities resulting from observations of the microuniverse. The implicate order is therefore not static, and "holographic" is a somewhat inappropriate term. A hologram is only a frozen record of an ever-changing scene. The term "holonomic," used in physics to describe linear dynamical processes, would be preferable.[106]

The fact that the holonomic implicate order is without boundaries; that every part enfolds or "contains" the whole; and that therefore the distinction between observer and observed is blurred so that observations no longer result in objects (i.e., observables) has led some physicists to note the intrinsic interweaving of perception and consciousness on the one hand and macrophysical and microphysical reality on the other. Thus Bohm includes an appendix on "Perception" in his book *The Special Theory of Relativity*,[107] and Wigner exclaims that modern physics deals with "relations among observations," not among "observables." An observable is characterized by invariance across observations; Heisenberg[108] in his famous principle pointed out that, in microphysics, the observed varies with the position and instrumentation of the observer. Bohr enunciated his principle of complementarity on the same grounds.[109] And, of course, Einstein made the same point with regard to the macrouniverse in his general theory of relativity. This enfoldment of observation into the observable has led some physicists, and some philosophers, Whitehead, for example,[110] into a panpsychism in which consciousness is a universal attribute rather than an emergent property of brain organization. Such views have interesting consequences for the analysis of the mind/brain issue,[111] bringing the concept of consciousness closer to that enunciated in the Eastern mystical tradition and the spiritual religious views of the West. Thus Capra[112] can proclaim a Tao of Physics in which the details of modern macrophysics and microphysics are matched to those of the mystical tradition. Science of this sort appears far removed from the objective operationism of the positivist and critical philosphers of the Vienna circle, for example, Carnap,[113] Feigel,[114] and their scientist heirs (e.g., Bridgeman[115] and Skinner[116]) of only a few decades ago.

On the Future

The major impact on the neurosciences of the views reviewed here has occurred in little more than a quarter of a century, between 1950 and 1975. The origins of these views can of course be traced into history. The shock waves produced by the impact have only begun to be felt in such intimately related endeavors as the behavioral sciences. Science as a catalogue of proximate causes in the Aristotelian sense, mechanistic in the Newtonian image, must give way to a science in which "final" causes are also searched and researched, and a science in which causality in the space-time domain must be, on occasion, suspended, if not generally superceded. A scientific endeavor dedicated to reducing all knowledge to CGS (centimeter, grams, seconds) dimensions will no longer suffice. Still, precision of thought and measurement, the hallmark of scientific as opposed to other knowledge, is not to be sacrificed. Science involves a sharing of knowledge, and sharing depends on replicability of results that in turn is based on precision. Pre-(s)cission, the analytical severing of part from part, is not enough, however, to deal with the new holism of the implicate order, nor even with the concept of gestalt or systems like computer programs. New multivariate approaches, enactment in addition to analysis (scission), new dimensions beyond the CGS are already being recruited into the practice of science. But integration of these new ideas into a "theory of science" is yet to come.

The impact on society of this approach to science is hard to anticipate. For example, the new views of the mind/brain relationship that have resulted from the changed concept of matter in modern physics and the "holonomic implicate" nature of the relationship of observer and observed can have dramatic consequences on man's view of himself, his nature, and his relationship to nature. A spiritual resurgence is certain to come, but just what form it will take and how it will affect our daily life is harder to predict. Medical practice may be completely revamped by holistic procedures: it is already established, for example, that placebos generate the endogenous secretion of the morphinelike endorphins in patients. Economics may take a new turn when holonomic principles are brought to bear. And even politics, the practice of the possible, may find the limits of the possible expanded beyond any current horizons.

There is no reason to expect that the sort of reasoning by analogy that has wrought the current revolution in science will cease. New developments, technical and theoretical, in engineering, chemistry, and psychology will continue to cross-fertilize the brain sciences—provided careful reasoning by analogy is fostered. The use of analogy in science involves taking a metaphor, using it to construct a precise model from inductively organized data, and testing that model deductively. If the past use of analogy presages the future, exciting discoveries lie ahead.

The advances in understanding in the brain sciences have been prodigious. One might even say that we have seen the last coming before Armageddon—a last glimpse of truth and beauty before our hubris destroys us. As we reviewed them, however, the brain facts themselves and the theories derived by the interactive functioning of human brains suggest a different, more optimistic stance. When what we have already learned has been assimilated into our culture, it will undoubtedly change the context within which further brain facts will be gathered and viewed. In the past such changes in context have continually renewed the human endeavor by providing new analogies. The way our brains are constructed gives us every expectation that such renewals will continue.

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STEPHEN JAY GOULD

The Evolutionary Biology of Constraint

Limits: The Biological Reasons

FOR AN EVOLUTIONARY BIOLOGIST, the primary theme of nature is its boundless diversity. More than a million species have been described, ranging from bacteria to toads to sequoias; among mites and nematodes alone many more than a million may remain to be discovered. As Robert L. Stevenson wrote:

> The world is so full of a number of things,
> I'm sure we should all be as happy as kings.

My use of boundless, however, is figurative. Diversity is stunning, but it is by no means literally boundless. In fact, the strong bounds that nature places on diversity provide our best starting point for a study of limits.

The most striking fact about the distribution of organisms in "morphological space" is the extreme variation in density. Vast regions of potential form are unoccupied, while others are swarming with minor variations on common themes—consider the half million or so species of beetles. This notion of morphological space is not purely qualitative or metaphorical; it can be quantified for organisms sharing the same body plan. David Raup has shown that most coiled shells can be adequately simulated by variation in just three generating parameters—the rate at which the generating curve expands, the rate of its translation down the axis of coiling, and the rate of its motion away from the axis (Fig. 1). Variation in these parameters can "convert" a snail into a clam into an ammonite into a brachiopod. If these three parameters are considered as axes of a cube, the potential morphological space of coiled objects can be defined. When all actual species are plotted onto this reference scheme, we find that living forms occupy rather little of the potential volume (Fig. 2).

The history of evolutionary thought has been dominated by two major traditions for the explanation of such limited occupancy. In one, the adaptationist program[1] that has prevailed under the "modern synthetic"[2] theory of evolution, constraints are imposed primarily by working solutions: all parts of the cube can be reached, and unoccupied regions represent ill-adapted forms. In the second tradition, long popular in continental Europe but virtually unknown in America today, constraints of architecture and history prevent the colonization of regions that might house designs of perfectly adequate function. I shall refer to this second tradition as structural integration.

In the two extreme formulations of these traditions, the direction of evolution is channeled either by adaptive requirements of local environments or by the nature of variation and the morphology of the system in which it arises. No one, of course, would embrace either extreme position in its entirety. The fundamentally adaptive nature of most major changes in evolution can scarcely be doubted. Similarly, even the most ardent selectionist does not view all directions of adaptive change as equally likely or even possible. Inherited morphology plays its role: no elephant will ever fly. The issue is a more subtle one of general attitude and first line of approach toward the solution of individual problems in research. The modern synthesist will ask, "What is this for?" or "Why is this the best form for such a function?" The "classical morphologist," working within the tradition of structural integration, will ask, "How is this

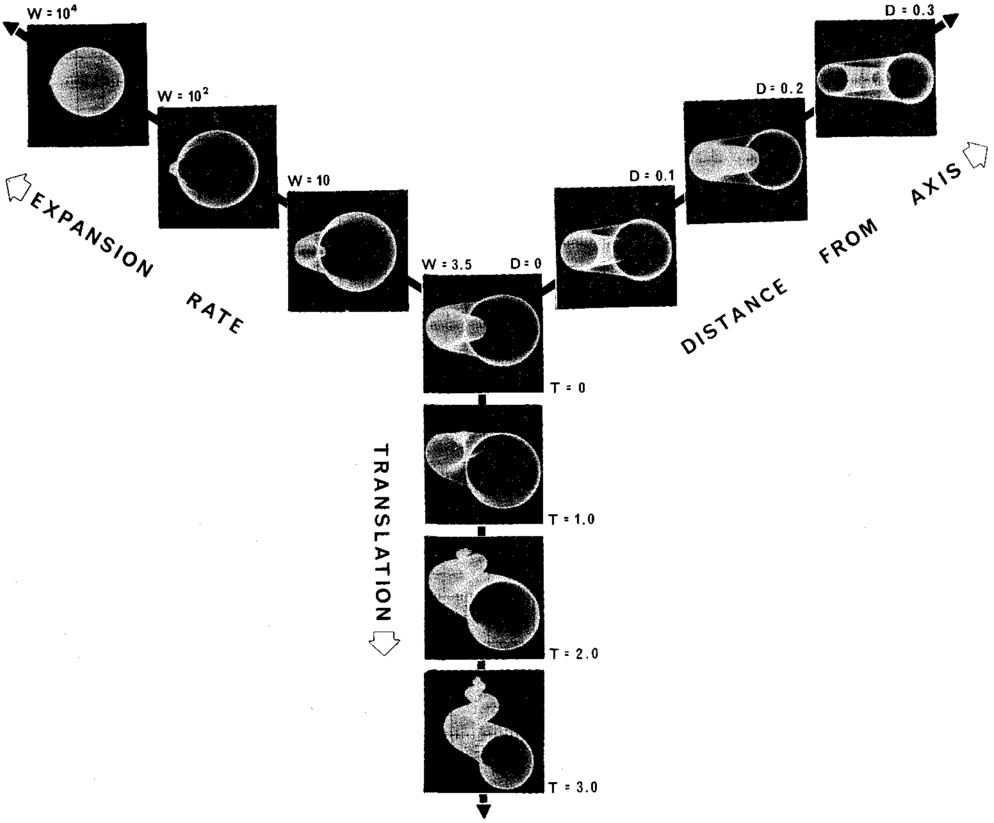

Figure 1. As each of the three generating variables increases, the basic form (center) alters to the standard configuration of a group of coiled animals. Increase in translation (movement of the generating circle down the axis of coiling) produces a "snail" (bottom). Movement away from the axis (with no translation down) produces an "ammonite" (right). Very rapid increase of the generating circle brings the object to its final size before it has an opportunity to coil very much, thus forming a "clam" or "brachiopod" (left).

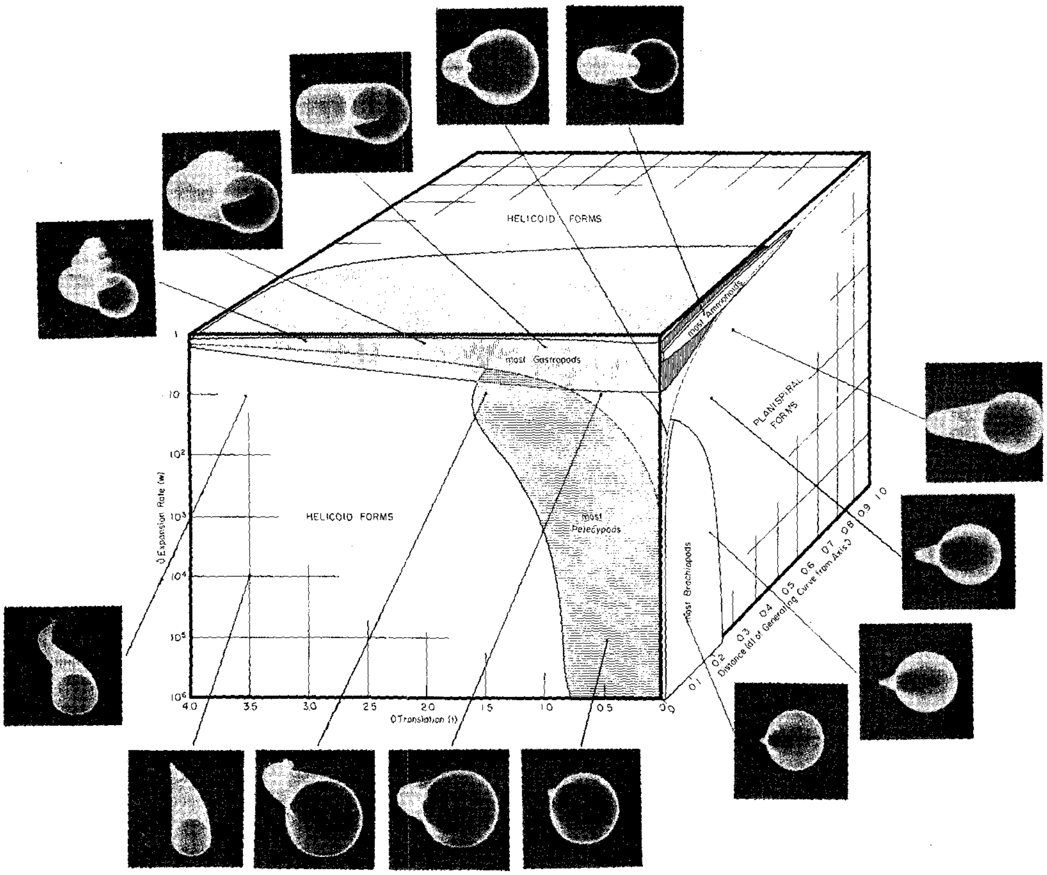
HELICOID FORMS
most Gastropods
most Ammonoids
PLANISPIRAL FORMS
HELICOID FORMS
most Pelecypods
most Brachiopods
Expansion Rate (w)
1
10
10²
10³
10⁴
10⁵
10⁶
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Translation (t)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Distance (d) of Generating Curve from Axis

Figure 2. The "cube of life" for coiled forms. Only the shaded areas (snails and clams) and two small unshaded areas on the right face (ammonites and brachiopods) contain abundant actual animals. Most of the potential cube is unoccupied by actual forms.

particular solution constrained by the architecture and inherited morphology of ancestors? What are the nonadaptive components arising from such constraint?"

If these were merely first lines of attack in a flexible system of alternatives, a preference for one or the other position might impose no great restraint on final conclusions. But the evolutionary biology of "why" is a frustrating area, full of speculation and uncertainty. Given the inventiveness of the human mind and a preference for adaptive stories, the failure of one specific proposal merely calls forth a substitute in the same mold. And the failure of all proposals usually elicits the response that there is as yet not enough known about the functional morphology or behavior of a specified organism to say why this particular structure is right for it. Thus, the adaptationist program contains no exit in most individual cases, even though any of its exponents would admit, in theory, that alternative styles of explanation exist.

The basic Neo-Darwinian buttress for the adaptationist program is the nature of genetic variability, the raw material of evolutionary change. For this program to work, the constraints of development, architecture, and inherited morphology must be erased, thus freeing organisms to travel an evolutionary path to optimal form in an engineer's sense. An approach to such effacement can arise if genetic variation is copious in extent, small (step by individual step) in magnitude, and occurs, without preferred orientation, in all directions (the meaning of random as it is used by evolutionists). If natural selection can choose from a large supply of raw material, packaged as tiny steps and available in all directions, the path of evolutionary change can be determined by selection leading to optimal adaptation. The direction of selection is not seriously constrained by the nature of variation.

Many of the central beliefs of modern Neo-Darwinism—such as the gradual nature of evolutionary change and the designation of evolution as a two-stage process of chance (random raw material) and necessity (natural selection)—flow from this view of variation as copious and ubiquitous raw material, and selection as a sole directing force. As Ernst Mayr, a major architect of the modern synthesis, put it, "The proponents of the synthetic theory maintain that all evolution is due to the accumulation of small genetic changes, guided by natural selection, and that transspecific evolution [across species] is nothing but an extrapolation and magnification of the events that take place within populations and species."[3]

But the adaptationist program may well be the most important consequence of this Neo-Darwinian vision—what August Weismann called the *Allmacht* of selection. In the adaptationist program, organisms are atomized into parts (called characters or traits), and these parts achieve their best configuration for local environments through the agency of selection. (No one denies correlation among parts by developmental and genetic linkage, but strict selectionists maintain that these correlations are weak relative to the power of selection to break them down.) The only major departures from part-by-part optimization reside in the concept of "trade-off." The demands of an optimized whole may require some concessions among parts. The enormous antlers of the Irish elk, though useful in competition for mates, eventually drain too much energy from the whole organism or are too much of an encumbrance in moving and feeding. Thus antlers stabilize below an optimum size based on their utility alone. Yet such trade-offs are only among parts for the greater benefit to the whole; the entire organism still evolves to the best form it could possibly maintain.

To return to the subject of limits, the adaptationist program views all parts as existing "for" some function and as best designed to perform it (subject to the proviso that selection works upon entire phenotypes and that parts may adjust to optimize the whole). Evolutionary limits are imposed by engineering. Anything consistent with the architecture of inherited material can be built, but very few possibilities are realized because so few potential forms work well. Occupancy on the molluscan cube reflects the relatively few areas of efficient function. No bivalve, for example, can have too low a rate of increase in the generating curve, because the umbones of a symmetrical bivalved shell would then touch (or even interpenetrate) and the valves could not open (Fig. 3).

As for human intellect, the primary concern of this symposium, the adaptationist program leads us to the position that our basic mental capacities are direct adaptations "for" something of survival value in our evolution. An individual's mental attributes are to be atomized and analyzed in terms of utility—in the Darwinian sense of maximizing copies of one's genes in future generations. This tradition supports a growing and speculative literature—some of it down-right silly and self-serving in an age of high royalties, some quite serious—on the adaptive value of such reified traits as aggression, male dominance, and xenophobia. The capacities that cannot be traced to pressures of selection in our primal state—the ability to write operas, for example—are regarded as a hypertrophy of the genetic program (the role of music in social cohesion, for example). The independent adaptive value of individual traits and the status of these traits as best possible solutions (at least in our primal environments) are the two keystones of the adaptationist program for its analysis of human intellect.

Under this vision, limits arise for two major reasons. They are imposed primarily by what the environment selected, not by what the organism's structure could produce. And, since our environments have changed so radically and evolution is so slow a process, we may be stuck for the moment with traits (like xenophobia) now injurious to global survival in a nuclear age.

Structural integration regards organisms as constrained and integrated wholes. It does not deny the fundamental role of natural selection as an agent of

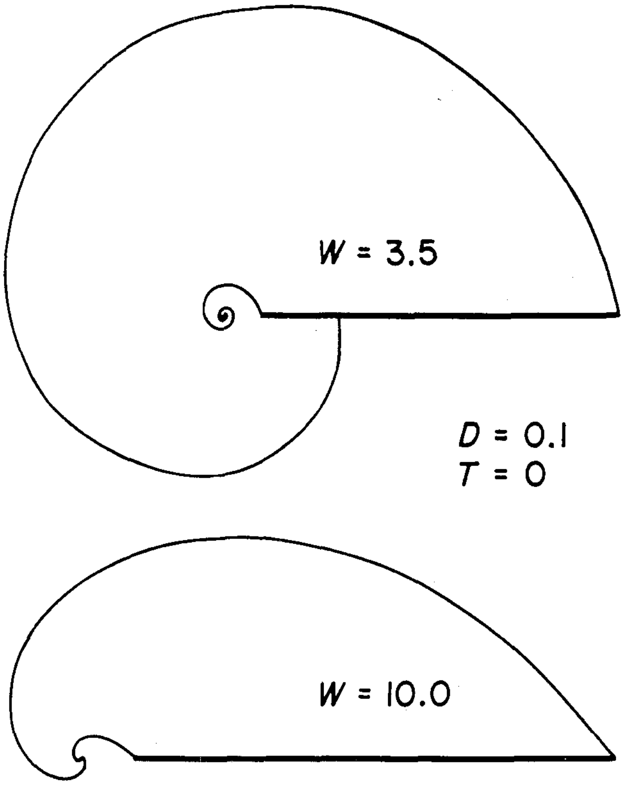

Figure 3. Why clams must maintain very high rates of increase of the generating circle. If the generating circle increases slowly (as at the top, where its rate is 3.5—low values imply slow increase), the shell coils several times before reaching its final size. If the rate is very high (bottom, where its value is 10.0), the circle expands so rapidly that very little coiling occurs before the shell reaches its final size. Since clams have two articulating valves, they cannot be built with low rates of increase because the umbones (the beaks, or tips, of the coil) would interpenetrate, and the shell could not open. You could not, for example, place a second symmetrical valve under the form in the top figure.

evolutionary change, but it emphasizes two themes that the adaptationist program tends to neglect. One is that the possible routes of selection are channeled by inherited morphology, building material, and the amount and nature of variation itself. Though selection moves organisms down the channels, the channels themselves—rather than the paucity of well-designed outcomes—impose primary constraints on the direction of change. The second is that selection on one part of a structure may impose a set of correlated and nonadaptive modifications on other parts of an integrated body. Many features, even fundamental ones, may be nonadaptive (though not, to be sure, strongly inadaptive) either as developmental correlates of primary adaptations or as "unanticipated" structural consequences of primary adaptations themselves.

Let me cite an example that contrasts the reasons for limits under the adaptationist program with the view of structural integration. Recently a colleague, a noted follower of the adaptationist program, assured me that land vertebrates had four legs *because* this number represented optimal design for locomotion of a bilaterally symmetrical, elongate body under gravitational conditions. Scarcely believing my ears, I reminded him that ancestral fish had four fins, the homologues of our arms and legs, for reasons quite unrelated to their later invasion of the land. We had inherited this configuration; fortunately (for we would not be here otherwise) it worked well. Four legs may be optimal, but we have them by conservative inheritance, not selected design. Other options are simply not available among the variations spontaneously occurring within the vertebrate body plan. (Reduction to two[4] might not have discombobulated the developmental plan—since evolutionary losses are accommodated more easily than gains—but Orwell's pigs were wrong, or at least making a social rather than a biological statement.)

The adaptationist program relies on the belief that genetic variation is copious, small in extent, and available in all directions. Structural integration must therefore hold a different view about genetic variability. Nearly one hundred years ago Francis Galton used a striking metaphor to describe this alternative view by arguing that evolving objects are not spheres (as in the adaptationist program) but many-sided polyhedrons.[5] The sphere evolves by rolling and can go in any direction through all gradual intermediate stages. The polyhedron rests on one face and can move only in directions represented by adjacent stable faces; its motion, moreover, must be *per saltum* rather than by insensibly graded steps. Constrained direction and discontinuous evolution arise as limits imposed by the inherited structure itself—the form of the polyhedron—not as a restriction of natural selection. Selection determines whether or not the polyhedron shall (metaphorically) topple over, and in which of a few possible directions it shall move, but the primary constraints are prior and structural.

Of the many reasons for structural constraint in complex organisms, the delicate orchestration of embryonic development must rank first. For 300 million years, embryos of land vertebrates have continued to form, and then to lose or to convert into other structures, the gill slits (and their complex pattern of circulatory tubes) that persist, for obvious functional reasons, into the adult stage of ancestral and modern fishes. This complex and circuitous pathway works well enough in building a human baby, but no engineer starting from scratch would have ordained such a design. It is not an adaptation but a reflection of how difficult it is to alter the early stages of development when complex embryonic structures are differentiating in a hundred directions, all dependent on prior configurations. Radically new and improved designs can be conceived, but nature provides no way to get there. The adaptationist program is an unwarranted extrapolation from minor adaptations (responses to small changes in local environments) to major overhauls in design. These minor adaptations are "easy" changes in late stages of ontogenetic development. You can repaint your car any color you wish, but this exuberance of choice is no model for its potential conversion to solar propulsion.

Minor adaptations are multifarious, but major reorganizations are rare and strongly constrained by inherited structure. Moreover, major alterations in external form are often based on small underlying genetic changes. These changes can have substantial impact on adult phenotypes because they operate by altering rates of development early in ontogeny, with cascading effects throughout later growth.[6] The stability of integrated systems may be so high that even major changes of form imply little alteration of the underlying developmental program. Evolution is, as François Jacob perceptively stated, a tinkerer, not a noble architect. Many of her most impressive products use only slightly reconstituted genomes, not fundamentally new blueprints.[7]

We ourselves represent a striking example of this conservative principle. King and Wilson[8] have reported remarkably small overall genetic differences between humans and chimpanzees. We share more genes than any measured pair of species within the same genus (though we are conventionally classified in different genera) and are even more alike than most pairs of so-called sibling species (those that are virtually indistinguishable in morphology). Our substantial overt differences in form and behavior are probably for the most part results of relatively minor genetic changes that have slowed down developmental rates in humans, leaving us, as adults, strikingly similar in many ways to the juvenile stages of other primates.[9]

Under the adaptationist program, limits to human intellect are imposed by the paucity of good designs and by the environments that established selective pressures for specific traits. In the view of structural integration, the limits reside primarily in the fact that we are, fundamentally, only slightly rebuilt apes. Most of the traits that we like to regard as quintessentially human (and tend to view as direct acquisitions "for" their current function) are inherited structures whose basic adaptation may have been set in distant ancestors. We may reconstitute these structures for different functions, but their basic design must constrain us in ways we scarcely understand.

Much of our hubristic intellectual history has involved a search for signs of our adaptive uniqueness. T. H. Huxley impaled Owen for his claim that only human brains contained a hippocampus minor, and that the secret to our godliness must lie there,[10] for Huxley had found this structure in all the great apes as well. More recently, we have located (perhaps properly) human uniqueness in language and abstract conceptualization, and have regarded cerebral asymmetry and some aspects of cerebral localization as its physical sign—and, presumably, as a direct adaptation in humans "for" these traits. But apes display a similar asymmetry, and some even have a lump where Broca's area is found in humans.[11] These features may be fundamental in human evolution, but they are reconstitutions of something that existed for other reasons (if for any direct reasons) in apes, not novel atomized and optimized attributes of *Homo sapiens*.

Constraints and Consequences

This revised notion of limits may seem more discouraging and inexorable than the constraints based on good design advocated by the adaptationist program. Are we really slightly reconstituted apes, constrained by structures built for roles only loosely related to our needs, and so tightly integrated in development that major pathways of potentially fruitful change are foreclosed? Would we not rather view ourselves as bodies composed of numerous parts, each directly designed for its immediate role?

Paradoxically perhaps, I regard the view of structural integration as not only closer to our current understanding of evolution, but also freer of a truly depressing notion of limitation. Under the adaptationist program, each major mental attribute is either a direct adaptation for something related to (or at least once related to) survival or a hypertrophy of the adaptation and, therefore, still based on and constrained by it. At its worst, the adaptationist program represents a kind of vulgar Panglossianism that relates everything we do to a material notion of utility. But the alternative view that I advocate here, with its focus on nonadaptation, frees us from the need to interpret all our basic skills as definite adaptations for an explicit purpose. We inherited, under great constraint to be sure, an ancient structure with minor modifications. Those modifications may have been adaptations for specific functions, but they also engendered a host of nonadaptive consequences. Our large brains, for example, may be minor reconstructions, based on a prolongation of rapid fetal growth rates to later stages of ontogeny. But the magnitude of structural change may bear little relationship to functional impact, while under the adaptationist program we have to view each impact itself as separately selected. A much bigger brain may be able to do all manner of wondrous things bearing no relationship to the initial adaptive reasons for increase, just as a computer designed only to issue the company's paychecks might stalemate me perpetually in tic-tac-toe. We need not view *Don Giovanni* as the hypertrophy of some primal instinct but as an important, nonadaptive byproduct based on a general level of complexity attained for other reasons.

Constraints *and* consequences. Under the adaptationist program, structures are expressly and optimally designed for their functions. What else can they do? Under structural integration, every constraint entails a suite of nonadaptive consequences that might be commandeered later for some (perhaps novel) function. The stricter version of constraint also implies a greatly extended flexibility in evolution. Constraints *and* consequences.

We may illustrate this paradox with a famous story from the history of evolutionary thought, usually told backwards because raconteurs do not identify it correctly as a debate about adaptation. Alfred Russel Wallace distressed Darwin greatly because he balked at the threshold itself: he applied natural selection consistently to all nature but refused to ascribe the human mind to its operation, opting instead for divine intervention in this case alone. Darwin, aghast, wrote: "I hope you have not murdered too completely your own and my child."

This story is usually told as an example of Wallace's cowardice and wishy-washy support for natural selection compared with Darwin's courageous consistency. In fact, this interpretation must be inverted. Wallace was the rigid selectionist of Darwin's era; Darwin himself was a pluralist (who believed, to be sure, in the primacy of selection, but who understood and emphasized the theme of nonadaptive consequences). Wallace applied his rigid adaptationist program to the human mind and came up short because the program itself is flawed, not because he felt at all unsure about the power of selection.

Wallace was one of the few nonracists of nineteenth century science. He believed that "primitive" humans possessed a brain every bit as good as his own. Yet, as a cultural chauvinist he did not doubt the superiority of British ways. If selection can only build for immediate use (the adaptationist program), how could it construct a brain capable of Victorian refinement in a savage who neither needed nor developed such *haute culture.* Wallace wrote:

> A brain one-half larger than that of the gorilla would . . . fully have sufficed for the limited mental development of the savage; and we must therefore admit that the large brain he actually possesses could never have been solely developed by any of those laws of evolution, whose essence is, that they lead to a degree of organization exactly proportionate to the wants of each species, never beyond those wants. . . . Natural selection could only have endowed savage man with a brain a few degrees superior to that of an ape, whereas he actually possesses one very little inferior to that of a philosopher.[12]

Thus, the Lord himself must have stepped in to award the savage his remarkable capacity.

Darwin, of course, did not deny that the brain had evolved "for" some set of functions; in that sense, he attributed its size in humans to natural selection. But he also understood that original function does not determine potential use. The brain is, after all, a complex machine. Evolved "for" one function, it can perform so many others as nonadaptive consequences of its architecture. God may be glorified in the B-Minor Mass, but the majesty of its opening *Kyrie* does not prove His existence.

As a methodology the adaptationist program has been most detrimental in the subtle way it discourages any emphasis on structure and its consequences. If every overt action is an adaptation, we ask "why" and focus on the construction of scenarios to explain utility. We do not pay much attention to structure, since optimal forms can always be made; the key question becomes, Why this form rather than another, not, What range of things can this form do? But if we switch our principal concern to the nonadaptive consequences of inherited structure in systems of change that affect all parts in integrated and unanticipated ways, then we must analyze the structures themselves. We must solve some basic riddles of neurology if we wish to understand why operas can be written, not only talk about the adaptive value of music. (We must also remember that basic answers to *why* they are written have little if anything to do with such reductionistic styles of science.) We may illustrate this important theme about structure and its consequences with an amusing contretemps about fingerprints between Francis Galton (no fan of the adaptationist program) and Herbert Spencer (a devoted zealot): Galton writes:

> Much has been written, but the last word has not been said, on the rationale of these curious papillary ridges; why in one man and in one finger they form whorls and in another loops. I may mention a characteristic anecdote of Herbert Spencer in connection with this. He asked me to show him my Laboratory and to take his prints, which I did. Then I spoke of the failure to discover the origin of these patterns, and how the fingers of unborn children had been dissected to ascertain their earliest stages, and so forth. Spencer remarked that this was beginning in the wrong way; that I ought to consider the purpose the ridges had to fulfill, and to work backwards. Here, he said, it was obvious that the delicate mouths of the sudorific glands required the protection given to them by the ridges on either side of them, and therefrom he elaborated a consistent and ingenious hypothesis at great length. I replied that his arguments were beautiful and deserved to be true, but it happened that the mouths of the ducts did not run in the valleys between the crest, but along the crests of the ridges themselves.[13]

A Brief Note on External Limits

Thus far, I have only discussed limits imposed by the structure and development of organisms themselves. I have tried to emphasize a paradoxical theme that I call constraints *and* consequences: a view of structural constraint far stronger than that permitted under the conventional adaptationist program actually implies in its concept of prevalent nonadaptation, a freedom and potential for design far surpassing that implied by the Panglossian view that each separate structure is designed explicity (and best) for its function.

Other structural limits must be imposed externally by the nature of environments and ecological space. I refer not only to the obvious adaptive restrictions of specific habitats (air is not dense enough to support heavy creatures in flight). Rather, I wish to emphasize the more general principle of potential limitation upon the number of coexisting species in a region—what ecologists call the principle of "limiting similarity."

Environments cannot house an unlimited number of species. Although "the world is so full of a number of things," that number is not infinite. Limits based on organic design (as discussed in the previous sections) are central to our consideration, but the nature of external space imposes its constraints as well. The ecological barrel can hold just so many apples.

An old principle of ecology called "competitive exclusion" holds that no two species can occupy exactly the same niche in an ecosystem, for if two species shared all resources and used them in the same way, one would almost surely hold an edge in efficiency, however slight. Even the tiniest advantage would, in time, lead to domination and eventual elimination of the less efficient species.

Stated in this way, competitive exclusion is an unsurprising truism. But it does lead, by implication, to a more interesting question. How many species may be packed into a single ecosystem? How similar can two species be before shared resources overlap sufficiently to guarantee the elimination of one. This degree of closeness is called limiting similarity.

Among ecological concepts that are easy to conceptualize and extraordinarily difficult to use, limiting similarity stands out. How can we measure the tightness of packing among species in an ecosystem? The general problem is far from resolution, but we have obtained some interesting empirical hints in very simplified circumstances. We can search for regularity in packing among species known to share single, measurable resources (particle sizes of food among seed-eating birds, for example). When resources can be quantified in such a linear way, we may establish "resource axes" and plot the ranges of utilizing species on them.

In a famous article, G. Evelyn Hutchinson[14] noticed that coexisting species, competing along at least one resource axis at the same level in a food web, often differed from each other in average body length by a factor surprisingly close to 1.26—the cube root of 2. (Since volume is length cubed, the 1.26 length ratio implies a doubling of weight between each pair of coexisting species.) The study of limiting similarity is still in its infancy, and numerology is always a dangerous game, but I can't help wondering whether this difference by doubling—a regularity that has shown up again and again since Hutchinson published his article—represents some fundamental aspect of limits to the closeness of spacing among objects of similar function.

Indeed, ecologists Henry Horn and Robert May have found the 1.26 ratio in an impressive series of sets designed to function either together or for similar purposes—a consort of recorders, graded wheel sizes in a manufacturer's series of tricycles and bicycles, and in a set of skillets.[15] The one apparent exception they found may be interpreted as further confirmation. The four stringed instruments of a modern orchestra increase too rapidly in length (1.8 for cello to viola and 1.7 for bass fiddle to cello). But they were not designed to be played together as a consort. A newly designed violin consort, a set of eight matched instruments built to be played together by a musician with no knowledge of Hutchinson's ratio, average 1.267.

A Longer Note on Cultural Limits

I stood in the Cathedral of Pisa last year, trying to read the inscription under Christ's feet in the large mosaic of the apse. I stared at it for half an hour and could make no sense of it, because one phrase talked of a lion and a dragon, while the other seemed to refer, quite reasonably, to an apse (where the mosaic stood) and a basilica (a style of church, if not, technically, the form of Pisa's Duomo). Finally I saw the small serpent squashed under Christ's foot, and I remembered the 91st Psalm: *super aspidem et basiliscum ambulabis et conculcabis leonem et draconem* (you shall walk upon the asp and basilisk and shall trample under foot the lion and dragon). During what I had regarded as a half hour of raw, objective empiricism, I had at least twenty times reversed the *p* and *s* of *aspidem* and had failed to notice the second *s* in *basiliscum*.

Anyone could tell similar stories of the channeling of perception by expectation. And if the effect of a momentary fixation can be so strong, what of the powerful and pervasive influences of culture and class? I was assigned the task of outlining some basic approaches to biological limits and have therefore devoted most space to this subject. Yet I believe that the social and cultural limits on thought and perception are so strong, prior, and pervasive, that the deeper and more purely biological limits rarely display themselves in any definite way.

The cultural conditioning of thought plays a particularly important role within science, largely because our positivistic traditions deny its impact. Scientists (even after reading T. S. Kuhn or even P. K. Feyerabend) tend to view the expunging of cultural prejudice and strict adherence to an objective scientific method as the marks of success or at least of rectitude. And he who denies the existence of a potent influence is least free from its effects. Scientists should be required to study the history of science not only for general humanistic reasons, but primarily because cultural influence is so hard to detect *in medias res*, yet easier to identify when the culture itself has been superseded. (Of course, the historians would also have to combat the positivistic prejudice that science marches to truth by shucking superstition and the notion that clear cultural influences in the past do not imply the continuing influence of such shackles.)

The history of many entire subjects reflects virtually nothing about the empirical world, and records instead a changing set of social influences (consider such fields as the study of group differences in intelligence, where the ratio of data to social importance is so low). The identification of prior prejudice in the "scientific" study of race is scarcely news, but I have approached the subject in a somewhat different way. I have reanalyzed the quantitative procedures and data—not just the interpretations—used by nineteenth century craniometricians and twentieth century mental testers, and I have consistently uncovered extensive cases of unconscious finagling and manipulation of data.[16] (Conscious fraud exists as well, but limits imposed by cultural presupposition reside in the extensive massaging of data that people perform *without* realizing what they are doing.)

Such overt and specific prejudice is relatively easy to identify and even to expunge. Far more subtle, deeper, and pervasive are the general attitudes that any age regards as obvious, logical truth. My own field of paleontology has been constrained to the point of direction by deep beliefs in ideas of linear progress, gradual change, and causal determinism—all cultural prejudices rather than evident truth, and all incapable of encompassing the entire fossil record. I have been particularly struck by how ideas of progress, hierarchy, and linear-ranking surface again and again, in field after field, to constrain the arrangement of messy data into a unilinear, ascending hierarchy, with strong remaining "disorder" regarded as an epiphenomenal disturbance of the primary rank, a residual, or the mark of a second and less important process causing lateral ramification. Thus, Charles Spearman identified clear evidence for cohesion among groups of mental tests (arithmetic and verbal clusters, for example) as mere "disturbers of *g*," his favored concept of general intelligence. And Lamarck a century earlier forced the ramifying tree of life into a primary component of rising complexity, and ranked everything that didn't fit as a secondary and tangential adaptation branching from the main ladder.

But even these prejudices, however deep and subtle, can be identified. What about constraints and limits that arise because solutions require metaphors or modes of thought that have not yet been conceptualized at all? Here history must aid us, for we cannot analyze the present. In the great eighteenth century embryological debates, for example, preformationists argued that a homunculus must exist in the egg or sperm, and that development must represent an unfolding of this preexisting structure. Epigeneticists argued that complexity arises *de novo* as a result of some unknown external directing force. Charles Bonnet, admitting that no one had seen a homunculus with the poor optics then available, declared that preformation represented "one of the most beautiful victories of pure reason over the senses."[17] It just had to be true. Order and complexity cannot arise from nothing. The structure must exist from the start. He was right, of course: information for the final result must somehow be contained in the egg. But he was wrong in conceiving this necessary information as the preformed parts themselves. We now know that it exists in the form of coded instructions within the fertilized egg. But the eighteenth century had no common metaphor for coded instruction. The pattern-weaving machine had been invented, and the music box might have served imperfectly, but an age without computers (not to mention player pianos) must be excused for not conceptualizing this happy resolution that rendered both sides right—epigenesis for its observation of increasing complexity, preformation for its insistence that information for the final structure must "be there."

Scientists are such a miserable lot of unreconstructed positivists! The original version of this article ended here, with the clear implication that culture acts only to constrain science and that scientists must study it in order to recognize the impediment. Then, at the Emory Symposium, Meredith Skura gently pointed out to me that I had made a surpassingly strange argument. I had spoken bravely of constraints *and* consequences when discussing the limits imposed by organic architecture and development. As my major claim I had argued that structural limits also display a flip-side of liberation: nonadaptive consequences pregnant with flexibility for responding to unanticipated environmental changes (while the adaptationist program views every structure as directly optimized and endowed with little "play"). Then, forgetting my own claim, I came to culture and discussed it only as an impediment. In a way, I have proved my point at my own expense. I was so caught in the ethos of science (even though I have tried, consciously, to combat this particular aspect of it), that I could only discuss culture as a veil before external truth. I failed to apply to culture my own argument of constraints *and* consequences. Dr. Skura reminded me, in short, that culture facilitates as well as constrains. Darwin, a century earlier, would have been regarded as a fool or madman (except that he would never have developed a theory that depended so heavily on Adam Smith's economics and Malthus's demography, to mention just a few facilitating sources from his general intellectual culture; and, like the unanticipated consequences of organic architecture, the facilitating aspects of Darwin's culture did not exist in order to call forth the truth about organic history!).

The pervasive influence of culture upon science is depressing only to those who still advance the discredited myth that knowledge so constrained is tainted and impure. I am no relativist. I share the metaphysical faith of all my colleagues that an external reality exists, and that it teems with definite answers if only we could know them. But cultural constraint, though it forces us to peer through a glass darkly, does assert the unity of science with all creative *human* activity. And as a practical matter it encourages greater humility and self-scrutiny. The identification of cultural limitation should be a primary activity of any scientist's searching. We might begin by suspecting that the conjunction of a conference on limits with the late 1970s is, unhappily, no accident.

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[1] See S. J. Gould and R. C. Lewontin, "The Spandrels of San Marco and the Panglossian Paradigm: a Critique of the Adaptationist Programme," *Proceedings of the Royal Society, London*, forthcoming.

[2] Julian Huxley coined this name in 1942 for the modern version of Neo-Darwinism, still a reigning orthodoxy among evolutionists, yet (in my opinion) on the verge of crumbling. It synthesized Mendelian genetics with the classical subjects of natural history by identifying small-scale Darwinian random variation with particulate micromutations of Mendelian character.

[3] Ernst Mayr, *Animal Species and Evolution* (Cambridge, Mass.: Harvard University Press, 1963), p. 586.

[4] Such reductions have, of course, occurred in the evolution of vertebrates, but no lineage has gained appendages. Many vertebrates move on two legs, but use their forelimbs for other functions. A few, like *Tyrannosaurus* and the kiwi, have reduced their forelimbs so much that they may not be (or have been) functional at all. Snakes, for obvious reasons, have no limbs at all.

[5] F. Galton, *Hereditary Genius* (New York: Appleton, 1884), p. 369.

[6] See S. J. Gould, *Ontogeny and Phylogeny* (Cambridge, Mass.: Harvard University Press, Belknap Press, 1977).

[7] See E. Zuckerkandl, "Programs of Gene Action and Progressive Evolution," in *Molecular Anthropology*, M. Goodman and R. E. Tashian (eds.) (New York: Plenum Press, 1976), pp. 387-447; F. Jacob, "Evolution and Tinkering," *Science*, 196 (1977): 1161-6.

[8] M. C. King and A. C. Wilson, "Evolution at Two Levels in Humans and Chimpanzees," *Science*, 188 (1975): 107-116.

[9] This general process, a slowdown in rates of somatic development, is called neoteny. In addition to its probable role in human evolution, it may be responsible for the origin of many major animal groups. See Gould, *Ontogeny and Phylogeny*.

[10] L. Huxley, *Life and Letters of Thomas H. Huxley* (New York: Appleton, 1906), vol. 1, p. 206.

[11] R. Leakey and R. Lewin, "The Origins of Human Language," *New Scientist*, 83 (1979): 894-7.

[12] A. R. Wallace, *Natural Selection and Tropical Nature* (London: Macmillan, 1895), p. 202.

[13] F. Galton, *Memories of My Life* (London: Metheun, 1909), p. 257.

[14] G. E. Hutchinson, "Homage to Santa Rosalia, or Why Are There So Many Kinds of Animals?," *American Naturalist*, 93 (1959): 145-159

[15] H. S. Horn and R. M. May, "Limits to Similarity among Coexisting Competitors," *Nature*, 270: 660-1.

[16] See, for example, "Morton's Ranking of Races by Cranial Capacity," *Science*, 200 (1978): 503-9. In a forthcoming book, *The Mismeasure of Man*, to be published by W. W. Norton in 1981, I reanalyze data compiled by nineteenth century craniologists and twentieth century mental testers.

[17] Cette hypothèse de l'Emboitement est une des plus belles victoires que l'Entendement pur ait remporté sur les Sens. C. Bonnet, *Contemplation de la Nature* (Amsterdam: Marc-Michel Rey, 1764), pp. 162-3.

JUDITH N. SHKLAR

Learning without Knowing

IT IS NOT UNIMAGINABLE that some day history will be considered obsolete. It will be said then that we know more than enough about the past, that history has reached its intellectual limits and that its possibilities have all been exhausted. If this should ever be seriously claimed, it will not be because the boundaries of history as a field of knowledge have finally been reached. Rather, it will be because of moral revulsion inspired by historical inquiries and literature. In principle, history cannot come to an end, but there might be no first-rate minds willing to study it.[1]

Historians can always find new subjects to consider. Obviously, the immediate past becomes a topic of historical concern tomorrow, often even before all the participants are dead. The opportunities for reinterpretation always remain open. No one needs to be reminded that every generation must reconsider its predecessors in the light of new experiences. The last word can never be said about history. There are at any time many good books on the same subject that in no way eliminate or diminish one another in the esteem of their public. Nevertheless, at various times since the first stirrings of the Enlightenment, historians have lived under the shadow of two self-accusations: uselessness and inaccuracy. And it would be these or similar charges rather than the inner logic of history that might reduce it again to its medieval insignificance. This is not a likely prospect but a reflection on the moral self-doubts that have characteristically placed limits on the possibilities of history as a form of knowledge.

Some sciences are discarded because they are found to be false, like phrenology. Others simply accomplish their task, like certain kinds of logic. Occasionally, a science is superseded by a superior one or transformed, even if its name does not alter, like pathology. History is not likely to suffer this fate. Inner tensions generated by moral uneasiness and self-rejection may, however, yield a pervasive sense that the discipline is futile, inadequate in its practices, and limited or misleading in its results. Historians have frequently experienced these periods of intense self-doubt. That does not mean they are likely to do so in the immediate future. On the contrary, at the moment most historians are seriously committed to the progress of their collective endeavors, and interest in the subject among the general public appears to be unflagging. To reflect on the recurrent attacks of paralyzing skepticism that have from time to time haunted historians is not to predict its imminent reemergence. It is rather meant to illuminate the patterns of moral thought that induce scholars to perceive the confines of their disciplines and the limits of their knowledge. The ways in which historians have measured and judged the possibilities of history is a general study in the practical import of various kinds of skepticism; for, while skepticism is sometimes invigorating and may inspire new ventures in historical research, it may also lead to a deadening sense of the limits of history.

Historians have a professional obligation to bring a skeptical judgment to bear on the study of the past. The records that the men and women of the past have left are usually misleading and inadequate in the quantity and quality of information they convey. Jumping to conclusions is not a sport in which a self-respecting historian can indulge. To be aware of that does, however, expose one to the hazards of pyrrhonism. It is of course quite true, as philosophers have reminded us, that if we do not trust the evidence of the past, we cannot believe anything at all.[2] While that is correct as a general proposition, it does not touch the psychological impact of history. Indeed, the philosophy of history, whether epistemological or eschatological, has almost nothing to say to or about the working historian and his actual difficulties. "The cosmic periphery" never even comes close to the area where intellectual decisions are made and professional standards established. The skepticism of historians reflects neither philosophical illiteracy nor competence. And it does not matter to historians that many other sciences also suffer from similar uncertainties.[3] No one is truly comforted by the troubles of others. The difficulties of historians arise directly from their craft: historical evidence is simply unreliable. Anyone who has interrogated witnesses to an accident will know that the film *Rashomon* was not so wide off the mark. The historian must also distrust his own impartiality. Finally, new evidence and new interpretive skills combine to make history so unstable, that a lifetime's work can be suddenly destroyed. And the intractable philosophical difficulties—such as, what is evidence at all—do not go away simply because working historians do not encounter them day in, day out. To become a historian is to learn what is and what is not to be recognized as a credible account, but this education does not occur in a vacuum. Philosophy is an unsettling presence for history.

These may be risks that all scientists face, but they affect historians with peculiar intensity. Because history is ineluctably didactic, general doubt tends to be translated into a sense of social futility. Even those historians who do not aspire to influence the public politically hope to do more than flatter and entertain their readers. The most ambitious expect to encourage desired social change; the most modest mean to dispel illusions and myths that thrive on historical errors. Even those historians who write for their professional peers expect history cumulatively to have a broadening and sobering impact on the practical consciousness of the educated public. Historians are therefore always at least partly teachers. With a few notable exceptions, most have spent their entire adult lives in universities, so that teaching has generally been a part of their daily self-awareness. Whatever the extent of a historian's didactic intentions may be, their fulfillment depends on his credibility. If he comes to doubt the possibility of recreating the past accurately, he also loses his social purpose. Skepticism thus undoes the historian doubly. Under these discouraging circumstances the most able young people may well decide to choose another scholarly career. Fortunately, historians do persevere, because there is an elemental pleasure in recovering and shaping the records of the past into an explicable order. Moreover, in spite of their uncertainties, historians learn to establish and adhere to common standards of verification and communication. Theirs is not a world of arbitrariness, because they have created a common professional ethos and an institutional setting within which history is appreciated, judged, and taught. There is thus protection against doubt, but it often falters. Not only can doubt undermine history as teaching, but didactic failure can also inspire severe doubt. Why, one then asks, does history achieve so little improvement? Could it be because it is inadequate knowledge?

The question that bedevils historians and also expresses their deepest worries is, What is the use of history? It had already tormented the *philosophes*, and as J. H. Plumb has noted, "In many ways the historian of today is in the position of the historian of the Enlightenment. He cannot accept the interpretation of the past of his immediate ancestors or even of the mass of society in which he lives. . . . Many historians therefore have taken refuge in the meaninglessness of history."[4] Those who do not choose to take that easy path to melancholy have felt compelled to defend the utility of history. In this they also resemble their Enlightenment ancestors. One returns to the Enlightenment, then, because its uncertainties are alive again, and because self-interrogation leads one to reflect on the origins of one's present condition. It was in the eighteenth century that intellectuals emerged as a self-conscious social group obliged to define and justify their social place and functions. They had to prove to themselves, as much as to their public, that they not only aspired to serve humanity, but that their writings were in actuality useful. It was not clear that history could meet that test. Had it been perceived as ineffectual, it could not have served as a refuge for them. To be futile was for the *philosophe* the ultimate failure. That is how craft and social role came to be ill at ease with each other in the mind of the historian.

Why was history so often condemned in the eighteenth century as frivolous learning? First of all, it was second-hand information taken on trust. It enjoyed none of the certainty that mathematics could claim. The historian was not an autonomous intellect directly in touch with truth. The world of two cultures was already deeply entrenched, and the republic of science already seemed to threaten the self-confidence of the older society of men of letters. More important, the subject matter of history was unedifying. As Locke put it, "What were those conquerors but the great butchers of mankind?"[5] In both cases, history fails as education and as a state of mind. It is a faulty way of thinking about unworthy subjects. Its uncertainty and uselessness reinforced each other in the eyes of its detractors. According to d'Alembert, "the bitter critics" of history said we had nothing to learn from such a record of error, superstition, and brutality. History was entertainment for an uncritical audience. It wasted time that might be better spent on thinking about God, nature, or oneself. Antiquity might be worth remembering, but all that was worth knowing about it was already known, so there was no point in adding erudite minutiae. In his defense of history d'Alembert necessarily stressed its moral advantages, since that was the issue. History "consoles, instructs, and encourages us" if it is written intelligently. It is, to be sure, highly speculative, but conjectural knowledge reminds us of our limitations and teaches tolerance and forbearance. Like medicine, history is finally uncertain, but "our only hope for improvement."[6]

Voltaire, who was a practicing historian, unlike d'Alembert, could think of even less to say on behalf of the subject. The only use history has is "that it teaches us our duties and rights without appearing to do so"—a moral primer, in short. In principle, he was committed to writing a new history that would deal with culture, peoples, and the heroes of the intellect instead of kings and wars. In practice, he did nothing of the sort, but agonized over the pitfalls that face the honest historian. Unreliable records and partisan, self-serving, stupid, and improbable testimony are all he receives from the past. Having turned to history in order to discredit the Christian tradition, Voltaire was eventually crippled by a historical pyrrhonism that made it difficult for him to believe in learning much about the past. Caught between the allure of mathematical certainty and historical vagueness, he suffered the typical fate of historians who are incapable of trusting the evidence of the past enough to make an effort to put it into a new order.[7]

One obvious question raised by these doubts was whether so defective a subject should be taught to the young. *Émile* does not learn much about the past. What, after all, is history without war? Who needs scholars and intellectuals at all, for that matter? Unedifying, false, and useless, the history of the past was wholly inferior to the history of the human heart that Rousseau himself wrote. His skepticism was so complete, that introspection was his only foothold in reality. His history of the human heart was therefore, of necessity, his own story, but that was more instructive than the tales about knights and nobles. This was certainly a logical response to history in disgrace. As fable, it might be well suited to the human heart, but its facts were simply inconsequential.[8]

Not all forms of skepticism are as hostile to history as Voltaire's and Rousseau's. Different as these two were, both made a fetish of distrust. A calmer, more diffuse skepticism is quite likely to favor history. Gibbon's religion had been tepid, and so was his atheism. He was even surprised that his readers should be offended by his purely "human" account of the origin and spread of Christianity. His general skepticism, like Hume's, did not single out history for special doubts. Gibbon began with a general state of doubt but avoided historical pyrrhonism, because it would only lead him to the sort of skepticism that contradicts the experience of daily life and ends in madness. History as an exercise of common sense, of critical judgment and reliable erudition, was a hedge against the pathology of skepticism.[9] That is why Gibbon considered himself a historian long before he had ever written a line. There is a passage in his memoirs that has puzzled many historians. Before he found his final subject, Gibbon toyed with a variety of possible topics. Among others, he considered the history of Charles VII of France, the Crusade of Richard I, the life of Sir Walter Raleigh, and the history of Swiss liberty and that of Florence under the Medicis.[10] There is no discernible relationship between these subjects, and none is suggested. Gibbon was simply hunting around for something to which he could attach his mind. What was never in any doubt was that he had a historian's mind.

"Without engaging in a metaphysical or rather verbal dispute, I *know* by experience from my early youth, I aspired to the character of an historian."[11] Gibbon, like most of the great historians of the subsequent century, wrote history because he felt compelled to do so, without a doubt about his vocation and with a feeling of utter indifference toward all and any metaphysical obstacles. When he entered Parliament he noted that it was "a School of civil prudence, the first and most essential virtue of an historian."[12] His moral priorities were the exact reverse of Voltaire's and d'Alembert's. They expected history to instruct us in our social duties. Gibbon felt obliged to acquire political virtues in order to become a better historian. He never even raised the question about the possible uses of history. On the contrary, he simply admired the scholars whose patient labors the *philosophes* disdained, and found Voltaire's histories excessively tendentious.[13] History was its own civilized and civilizing reward; it was not meant to impart crude lessons about tyranny and superstition. Men obsessed with these aims were not in a position to write history for its own sake. The *philosophes* took it to be their duty to disabuse and mold public opinion. They were far from sure about their ability to do so and whether history could be a useful means to that end. When they did write history, it was inevitably very inferior to that of a genius who simply had a vocation to account for the *Decline and Fall of the Roman Empire*, and did so by remaining above the spectacle of human folly that he observed and recreated.

Even a brief look at the pronouncements of the great European historians of the post-Napoleonic era reveals attitudes as remote from Voltaire's as from ours. There is no moral or intellectual self-doubt. Yet, these were critical historians of the first order, and in no sense credulous men. Some, like Ranke, were genuinely religious; others were not.[14] All were deeply involved in the institutional life of their societies. The nation and the universities did not merely provide a setting within which historians worked. These scholars were actively involved in shaping and sustaining them. Ranke, Droysen, Mommsen, Michelet, Fustel de Coulanges, and Burckhardt were teachers in the most extensive and intense degree imaginable. They did not have to seek out a place in the polity or strive to replace some clerical body in ruling the empire of opinion. They had found an honorable estate for their calling.[15] Theodor Mommsen was certainly critical of the practices of the German universities, and deplored the superficialities of their offerings, but he did not doubt that a university degree was the only "patent of nobility" worth having, or that history was as demanding as it was a noble vocation in Germany.[16] When Droysen spoke of history as the study of "the self-consciousness of mankind," he was expressing a shared professional belief.[17] It also implied that history had replaced philosophy as the summit of knowledge.

Even some of the more repressive German governments recognized the dignity of history and were ready to support mandarin historical faculties that were not expected to return any political favors. It was to be their glory to maintain the culture of Europe generally and of their nation especially. Their task was to educate future scholars and a cultivated laity capable of continuing and promoting their literary and scientific inheritance. In the view of these mandarins, even the state existed to serve culture. They were intensely national in their loyalties, but it was a political allegiance that was more comprehensively cultural than governmental.[18] The honors that the king of Prussia bestowed on Ranke were certainly deserved, but they signified official respect not only for a great scholar, but also for history generally. The kings of Bavaria were no less generous in their patronage of historians.[19] By the middle of the nineteenth century the German universities and their historians enjoyed a degree of prestige that could not have been imagined fifty years earlier.[20] In France, the social respect for history and the cultural ideals supporting it were no less secure, in spite of the political difficulties suffered by individual historians. History as the epitome of mandarin culture was free from all the doubts that had assailed the *philosophes*.

The first two national reviews devoted to the profession spoke for all. The *Historische Zeitschrift* would be neither partisan in politics nor merely antiquarian. It would deal with the past as "a vital link to present-day life." That meant paying special attention to the modern era and to Germany. "For our science has, fortunately, attained such significance . . . that its existence and progress have become part of our national life." Somewhat later the *Revue historique* announced its prospective purposes in very similar terms: "France has always honored historical research. . . . the study of France's past . . . is today of national importance."[21]

The sense of national importance did not necessarily imply an excessive degree of aggressive nationalism.[22] It reflected the deepest intellectual experience and the facts of life as then perceived. National sentiment had given historians a new and enormously energizing sense of continuity, a sense that, as most historians knew, the French Revolution had also rendered emotionally precious. When Fustel de Coulanges spoke with disdain of the facile analogies that the Jacobins had drawn between the classical past and their own situation, he revealed both the source and character of history as a science.

> History is not an easy science, its subject is infinitely complex. . . . the chances for error are countless and no one can hope to escape them. If we are not discouraged . . . it is because we believe that the honest search for truth is always rewarding. If we accomplish nothing else but throw some light on hitherto neglected points or call attention to some obscure problems, we shall not have labored in vain, and we should have contributed our share to the progress of historical science and to the knowledge of human value.[23]

It was years before a professional British journal appeared, and it modestly announced itself as a forum for university scholars. The beginnings of historical scholarship in England had also been modest. The universities came to sponsor historical studies as a way of sidestepping the theological and sectarian wrangles that culminated in Newman's conversion.[24] There was no state sponsorship and no organized research. Scholarship was, moreover, from time to time threatened by wayward outsiders, such as the autodidactic Buckle and Carlyle. The first proclaimed that history would have to become a "science" or deserve to die, while the second would have it reject our "merely vulpine intellect" and restore us to "faith and action."[25] History was ill-served by these prescriptions, because they raised exaggerated hopes it was bound to disappoint. Academic history was, by continental standards, diffident. It is not surprising that Bury looked at the achievements of European scholarship with envy. In his inaugural address of 1902 he noted with admiration what "the coincidence of the scientific movement and resurgent nationality" had wrought. History had been a means to social unity, but "science had controlled while the national spirit had quickened" minds above ideological partiality. Nationality had broadened the intellect to encompass the development of peoples, not just of states. Bury saw a future for British historians in the study of the "Celtic civilization," the "ethnical problem," and the "part played by race . . . and the effects of race blending . . . and that mysterious pre-Aryan foreworld." Bury did not seem to feel challenged by other sciences, but he was afraid of democracy as a material and spiritual threat to historical work. As always, America was the metaphor for all that was feared at home. On the continent the success of history was due to its public character and role. In England it remained private, and in a "democratic state [statesmen] are hampered by the views of unenlightened taxpayers. The wealthy private benefactors . . . , especially in America, are deplorably shortsighted; they think too much of direct results and immediate returns." They would have to be shown that history "is not a luxury . . . but a matter of inestimable concern to the nation and the world."[26] If one considers what Bury's historical and political intentions were, one shudders. Mandarin attitudes were not impeccable then and are not so now.

Bury was not intellectually unsure of himself in the way that Voltaire had been, but he had every reason to worry about his immediate social environment. Moreover, America was in this case not merely a reminder of the unwelcome advent of plutocratic democracy at home. Turner had a decade earlier made a far more abject defense of the utility of history to this unresponsive public. He did not doubt the spiritual worth of history, but its public value was a concern for him. One of his most admiring pupils remembered that Turner was actually fond of quoting Droysen's definition of history. He had as high a sense of his calling as any European historian, but he did not see himself as part of a mandarin culture. His burden of detachment was as heavy as theirs, even though, unlike them, he wrote a thoroughly democratic history of a democratic country. Like them, he had to make an effort to separate the man from the scholar.[27] But as an isolated, self-made mandarin he had to justify himself to a public that did not particularly respect history. Turner might rejoice in the knowledge that "even in young America Rome still lives," but his audience might well not care. To them, he had to speak of progress to be traced and of history as lessons in good citizenship for the pupils of public schools. It should inspire, as it had in Germany, a sense of public service. Finally, it would help Americans understand those European immigrants and their socialist ideas that were altering the country.[28]

Such were the humiliating claims that a learned and sensible man made on behalf of history as an intellectual discipline in a democratic society. So great a tension between personal and public views was bound to undermine the confidence of more sensitive historians. The fear of the cold indifference of the public was not altogether baseless, and found echoes in the minds of historians. For it was not just, as Bury seems to think, the vulgar who asked, "What is the use of history?" Historians also felt compelled to raise that devastating question. Those who were either not part of a stable university culture or who had no reason to look upon institutions of learning as the very heart of national life were most likely to doubt their own worth. They did so especially when they compared themselves to their colleagues in the natural sciences. Social dislocation and skepticism then acted upon each other in such a way as to turn doubt into despair. One need only read Henry Adams's account of his spiritual sufferings to understand the dynamics of intellectual self-contempt.

A comparison between Henry Adams and Jacob Burckhardt easily suggests itself, because they were so similar in their general outlook.[29] The differences may, however, be even more revealing. They shared a disdain for Grant's America, for what Burckhardt called "the arrogant belief in the moral superiority of the present," and a fear of the barbarians at the gate.[30] If anything, Burckhardt looked toward the future with more foreboding. The nightmare of a regimented egalitarian future did not make him a "pessimist," but a "malist," which was, in effect, an extreme apprehension.[31] But it never caused him to doubt his calling as a historian. Quite on the contrary, he felt an intense duty to save the past from the ravages of the future. "We shall study," he told his students, "the recurrent, constant, and typical as echoing in us." The revolutionary upheavals of the age had given historians a new will to remember and preserve. The time was the best possible for history, with no governmental or ecclesiastical censorship to obstruct scholarship.[32] In his middle years he was disappointed by his own work, but he blamed only himself for it. As a young man, proud of his work in Ranke's seminar, history had been "sheer poetry" for him, and his devotion did not waver.[33] Science posed no threat at all. "There is a friendship between science and history. . . . [both] are alone capable of a detached disinterested participation in the life of things." His skepticism was therefore only a scholarly necessity, not a consuming malaise. "False skepticism," by which he meant universal doubt, he thought a fashion that came and went. "True skepticism" is always welcome, however, because it is the only way to deal with flux, with "a world where beginnings and ends are unknown."[34] He was, finally, thoroughly at home in his native city and in its university. He refused to give public lectures in any city but Basle, where he thought it a gratifying civic obligation to address general audiences several times a year. Eventually he admitted to reducing all political questions to one: "Is it good for the University of Basle or not?"[35] In such a situation, it was not difficult to give one's life to what lasts, to the masterpieces of art, and to teach others to do so as well.

It is worth noting that what united history and science in Burckhardt's view was a common morality. Their utility or lack thereof did not concern him. Knowledge was for him not a product but a way of behaving, a specific type of self-restraint and an effort to efface the self, in order to promote a consciousness of the past that is quite simply loved, like poetry. It is not surprising that after the Second World War Burckhardt was revered as the very conscience of history, the best representative of its traditions, and, above all, as "the least deceived of nineteenth century historians."[36]

Burckhardt had a younger friend who reminded him of the uselessness and even dangers of history. Nietzsche's *Use and Abuse of History* was very much meant for Burckhardt's eyes. History was worthless as mere memory, political lessons, and as a detached science. It must serve "unhistorical" forces such as art or vitality. Creativity required new myths, not academic history.[37] Burckhardt politely ignored Nietzsche's onslaught. It was above his "poor head." He did justify his own teaching as an effort to help his students toward a " personal possession of the past," rather than to throttle them with information, but so personal a remark was an evasion.[38] Burckhardt knew that Nietzsche was not criticizing him—indeed, he knew he admired him extravagantly—but was attacking history as a science. Burckhardt did not even choose to reply. His entire life was, after all, a repudiation.

Henry Adams had no comparable resilience. He accepted his detachment as a burden. Circumstances and personal character combined to make him a "free-floating" observer, but it was not a situation he liked. He had no respect for himself, for his work as a historian and as a teacher, or for his readers. America had lost its values, and there was nothing he could do to raise its standards. Service at Harvard was the "most honorable in America," but Adams found it a useless occupation. He had not been trained for a profession, and had no desire to become a member of a scholarly society. History itself was "incoherent and immoral," and would have to be falsified to be taught to the young. It was, moreover, "a hundred years behind the experimental sciences" and without a theory of its own. It was neither as useful nor as certain as physics, chemistry, or economics. Nevertheless, Adams wrote many volumes of excellent history. When he considered his work, it disgusted him. No one wanted to read it; America had no use for the past, a point Burckhardt had noted also. However, Adams went on to agree with his countrymen. Why should anyone read a mere "antiquarian" who really was lost in the eighteenth century and who had "no use for history or method"? It was useless as education, as knowledge, and as character-building. However feebly, Adams therefore resorted to Nietzsche's advice and manufactured myths. Since cause and effect in history could not be known, the sequence of past events should be described in terms of "force and mass." Nice brutal words with a scientific ring to them, and if a need for order overwhelmed one, there were always the images of the virgin and the dynamo to satisfy a mind ignorant of science.[39]

When one abstracts what was purely idiosyncratic and personal from Adams's account of his wasted learning, there remains a quite typically disoriented historian. He had studied hard without achieving social power or intellectual certainty. His skepticism was as limited as Voltaire's. He did not doubt the truth of science, even though its findings upset him. It was history alone that was inadequate. "The historian," he wrote, "must not try to know what is truth, if he values his honesty; for if he cares for his truths, he is certain to falsify his facts."[40] From this he went on to doubt the possibility of education in a world in constant social flux. Yesterday's lesson is today's misinformation and practical obstacle. This world of becoming, so unlike that of the eighteenth century, could not be understood, controlled, or enjoyed. All was ignorance, save science, which only explained the flux. For Adams, this meant not only that he had failed to discover the right education for himself, but also that there was no way of learning the psychic skills needed to survive as an intellectual being. Those who seek knowledge about man must fail to profit from learning.

Henry Adams's difficulties were in fact more severe than those of the *philosophes*. Every form of skepticism is the denial of some specific form of certainty. The two are unthinkable without each other. From mathematics and religion the *philosophes* had inherited criteria of certainty that history could not meet. Their notion of utility was, however, comparatively modest. History had to destroy superstition and teach political common sense. The tests of credibility for Henry Adams were different. Could history yield laws on which reliable predictions could be made? Did its truths "work"? Were there technically applicable principles? History completely failed these tests. Moreover, standards of utility had been raised. To be useful, history must now do more than guide individuals; it must yield large measurable and tangible advantages, calculable as social wealth, for that had become the definition of utility. History did nothing to raise the standard of living or to promote the national interest abroad. For many, that was a death sentence pronounced on historical studies. Nevertheless, as one reads Adams, one recognizes that he willfully chose to leave Harvard and to adopt opinions that were designed to cast contempt on his own excellent work and that of other historians. He need not have been so self-destructive, and if he had reached a state of intellectual exhaustion, he had no one to blame but himself.

Henry Adams was not the last American historian to relive the predicament of the *philosophes* in this new and aggravated way. What came to be known as "relativism" worsened it for many scholars. The "true skepticism" of the historian, who recognizes the full extent of change within continuity and the distance that separates men in time, proved too much for some historians. In addition to being inaccurate and useless, history had to be written by men who were, like all their predecessors in history, part of their own time. Historians could not escape from their peers, their language, and their personal and public situation. It conditioned them, and they felt reduced. The fact that American history was now being pursued by a profession, socialized in universities and drawn from a broad geographic and social field, only seems to have enhanced the sense of being the spiritual prisoner of one's time and place.

Carl Becker was a perfect example of this mentality. History was, he fondly repeated after Voltaire, "a pack of tricks we play on the dead."[41] For a historian who was not also a poet, playwright, novelist, philosopher, businessman, and wit, that was surely a mortifying admission. Becker did not enjoy his modesty. Detachment was impossible, even "the cause of not espousing any cause" was due to the prevailing "climate of opinion."[42] Flawed records from the past, the necessity of selection, and the weaving of these remnants into a coherent account, all removed the final work from the realm of reliable knowledge. Historians make myths, and these should at least be useful. Becker did not even believe that this wayward effort could succeed. For him, the very character of historical knowledge was self-destructive and psychologically intolerable. He therefore took Rousseau's and Adams's path and rejected history both as education and as knowledge. Yet, he was very far from being a general skeptic.[43]

As in the case of Beard, Becker's skepticism was fueled by deep political emotions. At the end of a long debunking essay on historical facts, he suddenly, without even a transitional passage, moved from history's unreliability to its social inconsequence. The cause of this collapse of confidence was not primarily due to his adherence to a crude pragmatism. It came out of a devastating comparison between history and the natural sciences, now uneasy partners in American universities. History had failed even as a university subject, and no less so than as a social power. It was useless, because in a democracy, education meant no more than a distribution of information. Its universities were "institutions partly commercial and partly penal."[44] Teaching could not, in short, redeem history. Above all, the influence on public policy of one hundred years of historical research had been slight, especially when compared to the natural sciences, which inspired Becker's vision of utility and certainty. Inevitably, they also structured his skepticism and, with it, his desperate sense of futility. Both were expressions of a sense of inferiority vis-à-vis the natural sciences and an obviously overwhelming disillusionment. "A hundred years of scientific research has transformed the conditions of life. . . . It was scientific research that made the war of 1914, which historical research did nothing to prevent, a world war. . . . because of scientific research it became a systematic massed butchery such as no one had dreamed of or supposed possible."[45] The influence of history on social life had been "negligible," because it was incapable of preventing the self-destruction of the European world. It is very easy to perceive the flaws in the argument, but that does not lessen its interest. Becker identified usefulness with political power. He gratuitously assumed that all historians shared his political expectations and ends, and he was aghast at their ineffectuality. It was thus the situation of the intellectual classes and their failure to save the world that troubled him and made him lash out at "history."

Becker was not a particularly distinguished historian, but he still haunts the minds of historians, "an eccentric phenomenon" that continues to call for "special treatment," in the words of J. H. Hexter.[46] In his day he was widely respected by his peers and spoke for a substantial number among them. His very mediocrity makes him significant as a type. That he was not alone is equally clear. What Becker and Beard were saying in an American context was very much like Karl Mannheim's sociology of knowledge that emerged in Weimar Germany. In the midst of the ruins of mandarin culture he did not repine, but sneered at the pretensions of his predecessors. It had all been "ideology." Mannheim's proposition was simplicity itself. Every point of view is the expression of the social situation of those who pronounce it. Science was in fact excluded from this determination, because only a suprasocial observer can know the truth about the social causation that gave rise to ideologies and utopias. Moreover, eventually Mannheim came to insist that there was a pool of detached intellectuals who were rational, thanks to their disconnection from society. These paragons would therefore have both the interest and ability to be the planners of a future democracy.[47] This caricature of *philosophe* ambitions differed from Becker's view only in its estimate of the kind of control science would exercise over society. Historians would remain the passive voices of their social groups, "relative" to their time and place. This disheartened Becker, but not Mannheim, who was sure of his own rationality as an observer of the relativity of others, and who saw himself as the prophet of a new political class. He found in social science a replacement for the old mandarinism. Becker had to leave the world to what he took to be the destructive powers of science. He left it all in the hands of men who could neither know nor learn, because he had no mandarin resources at all, not even those of Turner, his teacher. Since no one was listening to history, Becker came to wonder whether it was really worth any attention. That is how the question of "What is the use?" arose, which, if it is asked under these spiritual circumstances, has to be answered negatively. Mannheim did not identify his own science with the irrationality he saw all around him and that he tried to explain. Becker was, however, defeated by unreason, because he thought he shared it.

In Becker's own eyes, it was not democracy that was disturbing his equilibrium. History was inherently too feeble to impose itself credibly on political man, as the comparison with the sciences revealed only too clearly. It was not merely the obstacles posed by democracy that Burckhardt, Adams, and Bury had seen. The whole European order had actually collapsed before his eyes, proving the moral weakness of all universities and all their historians. The war between history and democracy was in fact over. If history had any use at all, it was to serve Mr. Everyman, from whom professional historians did not differ. Because they were slightly better informed, they could help Mr. Everyman brush off a few errors and myths, but they were no more impartial, and commanded no greater intellectual resources, than he. This was a democratic mind in full revolt against the pretensions of mandarinism. To be a man of his place and time meant, for Becker, to adopt the mores of this peculiar figment of an uncommon imagination: Mr. Everyman. Becker was to suffer a final shock when he discovered that some Everymen were Nazis, and that there were historians who, sharing their climate of opinion, were also ready to offer their services to them. Always ready to accept new blows, he thought his brand of "relativism" had contributed to this disaster.[48] It is, in fact, difficult to see how a democratic modesty, perhaps a trifle spineless, could have contributed to the rigidly domineering fanaticism of the Third Reich.

In any event, the Second World War cured American historians of Becker's malady. Happy to distinguish themselves and their institutions from Europe, encouraged by grateful refugee scholars, they dwelt on the uniqueness of America and of its history. Mandarinism, the care and preservation of a culture by scholars who were impartial and aloof from political struggles, turned out to be a state of mind that was quite congenial to American historians and teachers celebrating a democratic culture.[49] For mandarinism is not simply the expression of a nineteenth century European situation. It can arise in a variety of settings. For most historians, this is the best state of mind to bring to bear on their refractory material. In using a neutral vocabulary, in keeping within a collegial framework, and in choosing topics professionally recognized as important they will be able to muster the evidence without undue distortion.[50] To be part of a republic of letters and adopt mandarin attitudes is the best choice for a historian who wants to preserve his self-confidence and avoid Becker's syndrome.

In spite of their eventual reconciliation, the quarrel between history and democracy had not, however, been without substance. Democratic theory, as has often been noted, does have decidedly unhistorical features. They are easily discernible in Paine and Jefferson. No generation owes anything to its predecessors, because the earth "belongs in usufruct to the living."[51] When one speaks of "the consent of the governed" and of majorities in general, one means those living "here and now," not their predecessors or their successors. It is the ultimate argument against tradition and also against foresight, as Madison replied.

Men who do not care about the past will care as little about posterity.[52] Progress might automatically take care of the generations to come. The reverence needed for social cohesion, which Madison also mentioned, was wholly neglected. In the event the logic of democracy has not prevailed, few democrats have been as explicit about it as Jefferson had been. If democracy means a people's self-appreciation, it should provide a large audience for popular national histories, as indeed it has. Nevertheless, science, which deals with the "here and now," however much scientists depend on their predecessors and look to the future, never faced a comparable conflict with democracy. The historian who has no pure will to preserve the past, as Becker apparently did not, will regard this primacy of the "here and now" as a sentence of death upon history. The internalization of one aspect of democratic theory proved fatal for Becker and his kind. The sense of the past could withstand it in other historians, both American and European, though Otto Hintze, Ranke's last heir, must remain the most extraordinary example of the intellectual will to survive honorably.[53]

That democratization can be integrated into a mandarin mentality need not be doubted, even though it can be a very difficult exercise. When historians become aware of a new and less class-and-caste divided public, and believe that they ought to become more democratic in their whole character, they may well face a real crisis of confidence, unlike Bury, who simply turned his back on that new world. After the Second World War a sudden rush of self-doubt spread among English historians. No one suffered anything comparable to Becker's difficulties, and mandarin habits of mind were adapted to new views and circumstances. Nevertheless, democratization was not a simple experience, and it opened new avenues of thought that affected, not the fringes of the profession, but some of its most established members. The basic question asked over and over again was whether there could be history without a directing moral purpose and sense of the future.[54] In a very real sense, the debate on either side of this issue was about whom historians should educate and how they should go about it. That history is meant to educate an indentifiable public had always been understood, but the public had altered, and historians wondered what their place now was. With that, the uses of history were again in doubt. Most English historians have been university teachers, but not all took that part of their work as seriously as Burckhardt did. Many had followed Voltaire in looking for a far more general influence, because the subject matter of history was overwhelmingly political, and universities trained public men. Hitler's war and the memories of the decade preceding it gave these concerns a new direction. Historians not only turned to contemporary history and ceased to eschew moral judgment, but many were also convinced that they had a special duty to give democratic society a sense of its future direction and purpose.

Democratization *is* transforming, and it demands both changes in the content of what is taught and in what is to be learned by historians. Since history is for and about everyone, and is, in fact more or less taught to all schoolchildren, no democratic historian can remain indifferent to the needs of this enormous audience. That was a great perplexity for English historians. It does make a difference whether one teaches the future rules of an empire or an undifferentiated middle class, an oligarchy or the people. Plumb, for one, welcomed a more extensive public, because he was persuaded that democracy offers the best setting for the disinterested pursuit of historical learning. Until now, the past was exploited to serve some oligarchy or other. That sort of past is now dead. In its place, history as the science of social change can now at last reach its intellectual maturity. This would also have a direct educational value. History might yet serve the multitude by taming "the education in techniques" that prevails so generally.[55] Above all, it might teach people to acquire those flexible attitudes necessary to live and prosper in a world in flux. It is history for the future, but it is not directly didactic in a crude sense. It is a well-meaning manifesto, but it is the work of a newcomer to the intellectual world of democracy. Plumb invests history with the hopes that John Dewey had for an education in the natural sciences. The relation between school curriculum and character has proved to be more complicated than he imagined, and the fact is that Henry Adams was right. We do not know what sort of education can prepare young people for an uncertain future.

Given this difficulty, one might simply try to make the middle classes of a democracy happier. R. W. Southern thinks that when historians teach the citizens of a modest state, such as Great Britain, they cannot just teach politics and law, but must expand their subject matter. More significantly, he thinks that one should teach history as a form of "enlightened enjoyment rather than as a rigid discipline." To that end, he recommends intellectual history as the ideal teaching subject. "The study of the environment can never lose its interest, but all this is preparatory to the study of the thoughts and visions, moods and emotions and devotions of articulate people. These are the valuable deposits of the past."[56] The guardianship of this legacy and its dissemination for the personal development of students is, in fact, the ultimate purpose of academic history. The moral stamina of the historian depends on recognizing and accepting that, for without it he will surely suffer the kind of disorienting skepticism that upset Voltaire and completely disintegrated Adams, Becker, and other victims of a rudderless intelligence.

That cultural history—the history of the creators of philosophy, literature of every kind, science, and the arts—ought in any case to be a primary concern of historians is not a new suggestion. Collingwood's *The Idea of History* is best taken as a defense of this history of states of mind. His argument is really quite simple. If history is about human consciousness, and if its end is human self-knowledge, then it is the study of minds. Every record that is examined is the expression of some thinking being. What historians look for is the mental world into which it fits. This reconstruction requires much imagination, empathy, and more than a touch of the novelist's art. It is not like science.[57] Collingwood did not think that the mental world of the inarticulate should be recreated, which was probably mere snobbery. For teaching purposes, however, its restoration *is* really less significant than expanding the spiritual faculties of young people by making them rethink those "valuable deposits" left by the great men of the past. Cultural history is also the most suitable way of providing an essential common education in a fragmented world of knowledge, and of preventing a pluralistic academic world from becoming a Hobbesian anarchy—or state. It can discipline this scholarly society as well as give students a shared mnemonic system. William James once noted that "you can give humanistic value to almost anything by teaching it historically."[58] You can also make it more interesting. It is an impractical project only if one thinks that the educated young individual gains nothing from possessing his past, sharing the language of its recreation with his fellows, and that the gift of "enlightened enjoyment" is beyond him. The chief difficulty is that it does call for a return to an older idea of usefulness as personal pleasure rather than as measurable social wealth.

If the history of ideas can reconcile historians to democracy as a subject of both teaching and learning, so can its very opposite: quantitative history. Nothing has done more to make peace between mandarin historians and democracy in America and France. Nothing has done more to quell skepticism among working historians. The democratization of values has in fact created a wholly new style of history. It devotes its attention to ordinary inarticulate people who leave few traces. It is of necessity statistical, since it deals with large groups of human beings and their usual concerns. Death, birth, food, migration, family life, conditions of labor, and disease are its obvious subjects. Quantification is only secondarily the instrument of accurate history. It is first of all and primarily the servant of the people. Originally, it was thought that such history would have to pay no attention to politics, the game of the elites. This is the history of the patients, not of the agents, of power, but a new sociological political history of the structures of power is not rejected, and even great men cannot entirely be excluded.[59] The history of political movements is, especially in America, far from alien to democratic thinking. It is, in fact, not so much quantification as expansion that is the trademark of democratic history. It includes groups never considered before: peasants in Europe, immigrants and blacks in America, and women and children everywhere. This all-embracing concern has its disadvantages. It is, paradoxically, highly undemocratic in one respect: readers do not like it. There is no public for quantitative and minutely sociological history. The closer history moves to the social sciences, the less popular it must be. The second disadvantage is specialization. It may enhance some skills, but it not only narrows the minds of young historians, it also poses a real threat to the quality of their work. Writing for a minuscule and intellectually highly homogeneous special audience can reduce criticism to details. It induces an atrophy of intellectual ambition. Nevertheless, democratization has given a "here-and-nowness" to history that has wiped away historical skepticism and its attendant despairs.

The plotting of long-range secular trends and mathematicization have not only given history a natural sciencelike appearance; they have reassured historians that theirs is a respectable endeavor. Productivity curves, price changes, demographic change, and the like that reflect "the typical and representative" are truly scientific, according to LeRoy Ladurie. Events and persons, the subject of the old history, are "merely anecdotal." His is not a view of science as effective technique, which was so fatal to Becker and his generation. This is a science that constructs "dynamic models" that may properly assess the relationships between diverse social phenomena over long periods of time. Unscientific history, which might appeal to nonprofessional audiences, belongs to the "cultural supermarket."[60] The intellectual barriers created by graphs and tables clearly have fortified the status of history. That is how quantification managed to create a democratic history that is not merely compatible with mandarin attitudes, but supports them. There is, moreover, no concern for usefulness at all. Indeed, one of the founders of this *real* history of Everyman, of the invisible many, Marc Bloch, opened his justly celebrated essay *The Historian's Craft* with the question, "What is the use of history?" but did not bother to answer it. He quickly turned to the opportunities and technical refinements of historical scholarship. Moreover, he saw his task in a highly traditional way, in spite of the great changes he had himself introduced, because he saw these changes as expansions of the manner and matter of history, as an improvement, not as a rejection. For Bloch, human consciousness was still the subject matter of history. "The interrelations, confusions, and infections of human consciousness are for history reality itself." That was, to be sure, exactly what Droysen had said a century earlier. Bloch was, moreover, not trying to educate France as a whole, much less Everyman. He knew that a historical tradition flowed through him from his teachers to his pupils in an unbroken, though highly critical, argumentative, and changing line of communication.[61] He spoke of his craft, not of his social role, and he found his usefulness in the former. This sense of intellectual continuity still prevails. His heirs rejoice in the democratization and expansion of historical subject matter that he began. Intellectually, there is now a tradition of historical writing that suns the particular and stresses the general. Once it was very new, but now Bloch's successors look back to him as he did to his teachers. No crisis of usefulness occurred, and there was no collapse of mandarin consciousness.[62]

In their self-assurance, no less than in their awareness of the institutional requirements of their work, these new historians are very much like the most traditional English historians who see no need to reconsider either their craft or their role. In these respects they share the conservative common sense of G. R. Elton, who, in most respects, is a strictly political historian, differing from Bloch and his heirs quite significantly in his work. For Elton, university education does not alter to suit a changed clientele, or society. The educative value of history is that it gives a certain solidity to the understanding, though it can also corrupt. For undergraduates, its chief value is that it extends the intellectual imagination by showing them how very different things can be from what they are here and now.[63] The practicing historian ought not to concern himself with the usefulness of history at all; it will only lead him to fiddle with the evidence.[64] A concern for usefulness is proper only for the tasks of education, which are an integral part, socially and psychologically, of a historian's professional life, not a tax extracted from him by society. Even so great a historian as Maitland was crippled, in Elton's view, by having no research students and no serious institutional support.[65]

Such views are perfectly suitable for an excellent historian who will surely train others like himself. Nevertheless, democratization and wars of our century were not trivial changes, and intellectual readjustment was unavoidable. A tradition is only as good as its ability to claim the allegiance of thinking men and women. An enlightened mandarin ought to ask why so many historians cannot accept his state of mind. One reason is that history can be taken as a refuge from the present, as the best path to the present, or as a link to the future. In the last case, especially if he has ideological loyalties, the historian will have every reason to make history politically effective here and now. An ardent democrat such as E. H. Carr accepts it as his obvious duty to give democratic society a sense of its future direction and moral purpose. Progress is certain, and historians must be, and in fact are, "consciously concerned to make contributions to the shaping of society in a particular mould." The historian has a special task: to help the majority of mankind to a "historical consciousness" and a positive sense of the inevitability of progress. Unlike Becker, Carr is buoyed by Mannheim's doctrine of the ideological sources of all knowledge, because he regards it as an invitation to join the conflict of opinions. Why seek a detachment and a certainty that must forever escape historians? He does not, moreover, compare himself unfavorably to the scientist in this respect, though his reasons for not doing so depend on a facile use of the notion of "indeterminacy" in physics.[66] The historian need be no more unsure of his facts than the physicist, and he has, in addition, a very special didactic social mandate.

Carr is, of course, quite right in recognizing that detachment is a pedagogic ideal, a striving for personal integrity by teachers in relation to their immediate and remote students. Max Weber had surely explained that years ago in *Science as a Vocation*. It is an aspiration that is never perfectly achieved, moreover, as most teachers know. Carr is, however, mistaken in thinking that impartiality is not also a purely scholarly goal. It used to be thought that it was easier for scientists to attain it than men of letters. That is an idea that is not as firmly held as it once was, not, however, because of the complexities of quantum physics, but because the social interactions among scientists and their place in the polity are known now to affect their work also. That does not mean that the pursuit of scientific knowledge is an uncontrolled personal impulse. It remains a highly disciplined activity in which personal inclination is checked by professional standards, tried and proved, and knowledge is steadily acquired, even if it lacks some of the security it once enjoyed. No historian should expect to enjoy either the kind of technological effect, public recognition, intellectual self-assurance, or new information that biologists achieve now. Carr is unrealistic in believing that he need no longer feel remote from scientists in these matters, and that he is somehow joining them by rejecting the ethos of personal detachment as neither possible nor particularly worthwhile. His is, however, surely a plausible reaction for anyone who is so certain of his ability to promote the welfare of mankind through writing a specific kind of history. Nevertheless, he may expose himself to all the ravages of Becker's skepticism if he resigns himself to the maleability of facts.

There is something deeply self-defeating even in Carr's happy "relativism," because his credibility also depends on his accuracy. A less resolute mythmaker may not be able to convince even himself that a history made to suit the occasion is acceptable. To trade off accuracy for usefulness seems worthwhile when one thinks that the alternative is an unattainable certainty sought at the cost of social irresponsibility. It may seem less appealing when the likelihood of intellectual demoralization is also taken into account, for only a very high level of ideological faith can render such an exchange tolerable. It has, of course, been argued that the mandarin stance is bound to support an established order and that it is therefore in its effects highly political. That does not reduce the difference between detachment in the interest of accuracy and a deliberate bending of the facts in one direction or the other. The mandarins may never reach their aims, because of the limits of available evidence and their personal inadequacies, but they can be judged according to their avowed standards. If taxed with the indirect political implications of their position, they can only say that these positions fall outside their work as historians, even though as citizens they may have concerns that oblige them to live at least two, if not three, moral lives, which is difficult, but not impossible. The historians who write history to promote a given social end directly make a far less straightforward decision even though it may seem easier to have only a single life. For the primarily useful historians also make a claim to accuracy. Otherwise they would not be believed and would cease to be effective. In doing so, however, they involuntarily validate the mandarin ethos—which they reject. They will not fall victims to skepticism as readily as the complex mandarins. Radical historians tend to scorn "positivism" and "objectivity," and argue about whether they should create a radical tradition or promote the coming revolution in their histories; but the spirit of doubt does not afflict their labors.[67] They do, however, live on the brink of dishonesty.

The demand for usefulness is always a threat to the equilibrium of the mandarin historians, who will be seized by skepticism when they are asked to account for themselves in terms that the craft of history cannot meet. That is the point at which the limits of history may be reached. Then it might be chosen as learning or abandoned as a moral and scientific failure. The past and an interest in it will, however, not disappear now that it has become a pervasive part of the cultivated consciousness. We no longer have the option of remaining ignorant of history, and, knowing that, historians will continue to work at their craft in a more or less mandarin manner. They need not think of themselves as victims of time and circumstances. The setting within which they can work best is strengthened or enfeebled by what they do. It is not a lot into which they have been fitted by some external force. They have created a discipline that demands some skepticism and much discrimination, a fair amount of self-restraint, and an ability to endure inner conflicts. These are acquired attitudes adopted in order to learn and teach history. The awareness of these and other limitations is simply inherent in history, not a fate imposed upon the historian. The uses of history are not those of science, which may be socially painful, but historians are not mere boarders in the university or outsiders in the world of learning generally. The psychological perils of didactic uncertainty and of unsteady knowing are real enough, but one does not need to be superhuman to accept them. Mandarins join the republic of letters knowing its imperfections. They will benefit from those who reject it by being reminded that the history of the wretched of the earth always remains to be written and that intellectual standards have to be reaffirmed rationally. If historians cannot believe in their own worth enough to do so, history will have reached its limits, and there will be an end to learning.

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[39] Henry Adams, *The Education of Henry Adams* (New York: Modern Library, 1931), pp. 329, 294-6, 301, 306, 302 and 315, 379-90.

[40] Ibid., pp. 496, 457.

[41] Carl Becker, *Detachment and the Writing of History: Essays and Letters* (Ithaca, N.Y.: Cornell University Press, 1958), p. 27; *Everyman His Own Historian, p. 169.*

[42] Ibid., p. 26; *The Heavenly City of the Eighteenth Century Philosophers* (New Haven, Conn.: Yale University Press: 1932), pp. 1-31. The *philosophes* were "credulous and skeptical," because Becker's own values and attitudes were really very close to those of the *philosophes*. That is why he was so angered by their failure to reach his unhappy conclusions about progress and posterity.

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[44] Becker, "Learning and Teaching," *Detachment*, p. 120.

[45] Becker, "What are Historical Facts," Ibid., pp. 63-104.

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[47] Karl Mannheim, *Ideology and Utopia*, Louis Wirth and Edward Shils (trs.) (New York: Harvest Books, 1936); *Man and Society in an Age of Reconstruction* (London: Kegan Paul, 1940), passim.

[48] Becker, *Everyman His Own Historian*, pp. 233-55; Hexter, *On Historians*, pp. 37-40.

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[51] "Letter to James Madison, September 6, 1789," *The Portable Jefferson*, Merrill D. Peterson (ed.) (New York: Viking Press, 1975), pp. 444-51.

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[54] See, for example, E. H. Carr, *What Is History* (New York: Knopf, 1962), p. 176; Plumb, *The Death of the Past*, pp. 139-45.

[55] Plumb, Ibid., pp. 17, 57.

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[61] Marc Bloch, *The Historian's Craft*, Peter Putnam (tr.) (New York: Knopf, 1953) pp. 151, 3-4.

[62] Le Roy Ladurie, *Territory of the Historian*, pp. 17-24.

[63] G. R. Elton, *The Practice of History* (Sydney: Sydney University Press, 1967), pp. 39-50, 146-54.

[64] See also Oscar Handlin, *Truth in History* (Cambridge, Mass.: Harvard University Press, 1979), p. 103.

[65] G. R. Elton, "Maitland and his Work," *The Cambridge Mind*, Eric Homberger, (ed.) (Boston: Beacon Press, 1970), pp. 77-79.

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JAMES A. BOON

Comparative De-enlightenment: Paradox and Limits in the History of Ethnology[1]

> The adequate record of even the confusions of our forebears may help, not only to clarify those confusions, but to engender a salutary doubt whether we are wholly immune from different but equally great confusions.
>
> —A. O. Lovejoy

CLIFFORD GEERTZ URGES ANTHROPOLOGISTS to "leave the garden" of the Enlightenment's "uniformitarian view of Man" and to navigate the perilous philosophical waters of cultural theory:

> Man is to be defined neither by his innate capacities alone, as the Enlightenment sought to do, nor by his actual behaviors alone, as much of contemporary social science seeks to do, but rather by the link between them, by the way in which the first is transformed into the second, his generic potentialities focused into his specific performances.[2]

Geertz warns us of the consequent dangers of relativism and advises us to face human diversity squarely. I would make this addition to his observations: one component in the range of cultural diversity is that very uniformitarianism that I join Geertz in doubting. Paradoxically, when cultural anthropologists turn to history, we must attempt to understand among all other traditions one that would thwart our own enterprise. An anthropological critique of Enlightenment uniformitarianism cannot simply reject it but must dutifully compare it to other sciences and/or magics in other times and cultures.

In this essay I employ two strategies to characterize and question an abstract style of converting cultural diversity to uniformity that became routine during the Enlightenment. First, I somewhat contentiously contrast the style to often denigrated predecessors. Then, I trace transformations between such styles in one disturbing case, full of incongruities and ironies, in the history of ethnological images. I seek neither to congratulate nor condemn the Enlightenment itself, or for that matter the Renaissance or Middle Ages.[3] The history of anthropology requires no such invidious comparisons between eras, just as the pursuit of anthropology requires no invidious comparison between cultures. Rather, I stress a particular aspect of Enlightenment assumptions pinpointed by A. O. Lovejoy:

> Assuming human nature to be a simple thing, the Enlightenment also, as a rule, assumed political and social problems to be simple, and therefore easy of solution. Rid man's mind of a few ancient errors, purge his beliefs of the artificial complications of metaphysical "systems" and theological dogmas, restore to his social relations something like the simplicity of the state of nature, and his natural excellence would live happily ever after.[4]

I argue merely that this "presumption of simplicity" afforded no more adequate a means of cross-cultural knowledge than some of the value-laden interpretations *philosophes* disowned. I isolate and compare not the Enlightenment "itself," but the Enlightenment's "other"—that is, the antithetical other behind any culture's sense of itself—in particular its formulations of exotic comparisons. This style of ethnology persisted even after ethnographic description began in the eighteenth century to convey the circumstantiality of remote peoples. It has continued, with evolutionary embellishments, through the nineteenth century down to our own day. Because ideals of a uniformitarian nature behind cultural diversity are by no means the profoundest legacy of the Enlightenment, their tenacity grows all the more provocative.[5]

Let me foreshadow our concerns with a preliminary glance at the most ambitious history of preprofessional ethnology yet written, Margaret Hodgen's *Early Anthropology in the Sixteenth and Seventeenth Centuries.* Hodgen reviews works of the Ancients, the Church Fathers, scholastics, missionaries, traders, collectors, discoverers, and philosophers in her quest for scientific objectivity about remote peoples and customs. Her important book is perhaps most interesting for not quite attributing such objectivity to *philosophes.* Nevertheless, Hodgen's hopes for "unencumbered observation" place her entire effort within Enlightenment values. She sees a "scientific impulse" as the prime mover of anthropological research, crediting both Herodotus and Columbus with a kind of beginner's luck. Her standards of judgment can be glimpsed in this discussion of the fourteenth century:

> In some respects, all three of these men—Carpini, Rubruck, and Marco Polo—deserve to be compared with Herodotus. They were not mere compilers or copyists. They were not true believers in the strange creatures . . .with which medieval ignorance had peopled the margins of the world outside the narrow [?] confines of Christendom. Each of them was . . . a breaker of the spell of ethnological tradition, with its abundance of oral or written reiteration and repetition. What they lacked most was the old Greek's detachment and fundamental humor. Certain practices among Asian or Barbarian folk were utterly repugnant to the two friars. . . . Absent also was the moral, philosophical, and historical breadth of Herodotus' horizon. . . .
>
> The accounts of the two missionaries were not motivated by scientific curiosity. They were practical intelligence reports. . . . Marco possessed curiosity, but he lacked the scientific impulse to find out, if possible, why people were as they were.[6]

We can, of course, sympathize with Hodgen's interest in healthy ethnographic curiosity: what would prompt the medieval European trader, dealing with an Arab in gestures, nods, and lingua franca, to wonder whether the Arab marries, much less whether he marries his father's brother's daughter? And what would justify not suppressing such information on foreign customs in order to guard commercial advantage?

But to credit Herodotus, and practically no other, with detachment and scientific curiosity begs vital questions in the history of anthropology. Hodgen proceeds to chastise more than two millenia, particularly the Middle Ages, for succumbing to a "hypnotic tide of ethnological fantasy." If, however, we check Hodgen's estimation of Herodotus against an actual account by him, the line between "the scientific impulse to find out" and medieval fantasy grows less distinct than she implies. Here, for example, is Herodotus on Egypt:

> Not only . . . [are] the rivers unlike any other rivers, but the people also, in most of their manners and customs, exactly reverse the common practice of mankind. The women attend the markets and trade, while the men sit at home at the loom; and here, while the rest of the world works the woof up the warp, the Egyptians work it down. . . . In other countries the priests have long hair, in Egypt their heads are shaven. . . . Dough they knead with their feet; but they mix mud, and even take up dirt, with their hands. They are the only people in the world—they at least, and such as have learnt the practice from them—who use circumcision. They practice circumcision for the sake of cleanliness, considering it better to be cleanly than comely.[7]

Interweaving empirical fact (the direction of the Nile) and opinion, Herodotus contrasts Greece and Egypt in perfect opposition. Nor was he "unencumbered" in favoring civil societies, however diverse their conditions, over barbarian ones.

As we shall see, much medieval and Renaissance stereotyping worked in the same way (at some level all ethnology employs polar distinctions). Moreover, Hodgen's allusions to "narrow confines" notwithstanding, Christendom sanctioned among its expanding and diverse members customary usages equally as contrary as Herodotus's distinctions between Egypt and Greece. Whether the range of diversity across Christian sects was more or less than the range of diversity catalogued in Herodotus is impossible to measure. Culturally, a sectarian or ritual difference is as great as concerned parties perceive it to be. Circumcision, for example, may distinguish cleanly Egypt/comely Greece, Coptic Christians/Catholic Christians, or chosen/condemned. Historians of ideas in anthropology, rather than contentedly applauding disinterested Herodotus on curious Egypt and excoriating ignorant ecclesiastics on threatening Tartaria, must take note of the Church's own diversity as well.

Hodgen poses a crucial issue in the history of ethnology: What enables outsiders to stay judgment rather than ignore exotic customs, reproach them, or appropriate them for simple ends of profit or domination. But she subsumes the issue under hopes of "unencumbered observation," thus implying that observers can fully escape culture and history to gain, Enlightenment-like, rarified objectivity. If ethnology required mere uniform objectivity to advance, it would have culminated during the Enlightenment. That it did not points toward comparative anthropology's paradox and limits. This essay attempts to embrace them.

Comparing Eras Crossing Cultures

Pre-Enlightenment views of human variability revolved around ideas of diminished divinity. Medieval compilers and Renaissance cosmographers considered "similitudes" of Christian texts, sacraments, doctrines, and rituals discovered in remote populations to be evidence of a lost unity. Interpreters and translators sought to restore total intelligibility to the diversity of languages, alphabets, and customary usages documented in history and travel. Babel as a second fall (after sexual awareness) into a multiplicity of tongues, and Kabbalism as a means to repair it, are just two examples of "philosopher's stone" motives of and for translation. George Steiner has reviewed a host of related themes:

> Theologians and metaphysicians of language strove to attenuate this second banishment. Had there not been a partial redemption at Pentecost, when the gift of tongues descended on the Apostles? Was not the whole of man's linguistic history, as certain Kabbalists supposed, a laborious swing of the pendulum between Babel and a return to unison in some messianic moment of restored understanding? Above all, what of the Ur-Sprache itself: had it been irretrievably lost? Here speculation hinged on the question of the veritable nature of Adam's tongue. Had it been Hebrew or some even earlier version of Chaldean whose far lineaments could be made out in the names of stars and fabled rivers? . . . Jewish gnostics . . . Paracelsus . . . seventeenth-century Pietist . . . almost all linguistic mythologies, from Brahmin wisdom to Celtic and North African lore, concurred in believing that original speech had slivered into seventy-two shards. . . . Which were the primal fragments?[8]

Ideals of the lost language of Paradise imbued interpretations of human diversity with a sense of plenitude and lapse. Both connotations were rejected in subsequent Enlightenment views of human uniformity. For the universal grammar of Adam reapproached through translation, *philosophes* substituted a uniform grammar of abstraction constructed through analysis. The Pre-Enlightenment imagined diversity as a broken mosaic of once-divine perfection. Later, Voltaire, in verses doubtless more playful than the views they summarized, could confidently assert:

> La morale uniforme en tout temps, en tout lieu . . .
> C'est la loi de Platon, de Socrate, et la vôtre.
> De ce culte éternel la Nature est l'apôtre.
> Cette loi souveraine en Europe, au Japon,
> Inspira Zoroastre, illumina Solon.[9]

Put so baldly, and considered in light of what it replaced, such uniformitarianism suggests more assiduous anticlericalism than scientific advance.

The contrast I wish to emphasize between pre-Enlightenment interpretation and uniformitarian analysis has been elaborated by French intellectual historian Michel Foucault. In his controversial and difficult *The Order of Things*, Foucault characterizes medieval and Renaissance visions of a "full and tautological world of resemblance." Interpretation, as I understand it, proceeds by looping through the diverse varieties of flora, fauna, languages, doctrines, rituals, metals, and elements to uncover "similitudes" with the texts of Scripture and the ancients, according to an image of perfection (Paradise, Golden Age) only temporarily obscured. Foucault radically opposes to such interpretation seventeenth-eighteenth century methods of knowing:

> It is no longer the task of knowledge to dig out the ancient word from the unknown places where it may be hidden; its job now is to fabricate a language, and to fabricate it well—so that, as an instrument of analysis and combination, it will really be the language of calculation. . . .
>
> It was the sign system that gave rise simultaneously to the search for origins and to calculability; to the constitution of tables that would fix the possible compositions, and to the restitution of a genesis on the basis of the simplest elements; it was the sign system that linked all knowledge to a language, and sought to *replace all languages with a system of artificial symbols* and operations of a logical nature.[10] *(italics added)*

Earlier interpretations construed diversity to reveal traces of resemblance to divinity/diabolicalness. Enlightenment methods construed diversity as conforming to taxonomies of measures. In Foucault's terms, everything hinged on "the possibility of establishing an ordered succession between things, even nonmeasurable ones. In this sense, analysis was very quickly to acquire the value of a universal method. . . . So there first appeared general grammar, natural history, and the analysis of wealth."[11]

In Enlightenment anthropology, measuring nonmeasurable things entailed charting human differences in analogy with natural differences, like species-diversity. I shall briefly characterize (actually stereotype) this brand of analysis, and then oppose it to previous traditions that read all diversity, both sectarian and what we would today call cultural, across biblical and ancient subtexts.

The Enlightenment construed diverse customs as deviations from a natural norm, ultimately embodied in figures like Voltaire's "L'Ingénu," the native *naïf* (incidentally and ironically Huron) ripe for reasonable enlightenment. Buffon on human kinds, Condillac (following Locke) on language and sensations, and other philosophers fabricated tabular arrangements of cultures as if all pertinent differences, even moral ones, could be physically measured. Consider, for example, Helvétius's response to Buffon, discussed by Michèle Duchet:

> For Helvétius man differs from animal not through a spiritual substance, but through particular physical characteristics. A flexible hand and fingers, a longer life, a grander natural weakness, a more constant society, a plasticity of species that lets him be born and live in all climates: these are the distinctive traits of the human species. We see that Helvétius takes over most of Buffon's observations on *le physique* of man. . . . for Helvétius the human animal is a *homo faber*, and what distinguishes him from animals is the use he makes of his faculties thanks to their organization. While Buffon grants animals only material "interior sense" and a kind of very inferior memory he calls "reminiscence," Helvétius considers physical *sensibilité*, or the faculty for receiving different impressions produced by external objects, and memory or "continued sensation" as faculties common to man and animal; and he considers them "the productive causes of our thoughts."[12]

In *De l'esprit*, Helvétius outlines a uniformitarian materialism and a standardized mechanism of passions (still calling nature "God"): "It seems that in the moral universe as in the physical universe, God has put but a single principle in everything that has been. That which is and that which will be is but a necessary development." Helvétius can then analyze human varieties—from Hottentots and Caribs to Fakirs and Brahmins—as so many gradable divergences, through political and religious corruption, from natural moral laws.

Such views finally identify uniformitarian nature with reason itself. And reason, ultimately philosophical rationality, is situated at an abstract remove from any particular customs, languages, or mores. Buffon again illustrates the tendency: he analyzes traditionally sensational cross-cultural topics—eunuchs, harems, human sacrifice—by charting them as innocuous correlations between sexual forces and vocal range, long before modern anatomy and hormone theory. The notion of a neutral analytic locus, equidistant from (and unscathed by) all cultural extremes, was the most enduring simplification in Enlightenment comparative studies.

Below I shall provide further examples of Enlightenment taxonomies, versus Renaissance emblems, of other cultures. But even this brief mention of Helvétius and Buffon raises a question fundamental to the history of ethnology: What is the difference in objectivity between revealing a scriptural similitude beneath diverse customs and constructing an artificial table across them? Does a secular analysis of harems and human sacrifice as abstract variables mark an epistemological advance over pre-Enlightenment interpretations that, for all their value-ladenness, often contained as much ethnographic information? Is the difference a matter of increased rationality, as Enlightenment philosophers needed, culturally, to think? Or is this difference, too, a kind of simplification?

The Enlightenment formulated abstract measures of cultural features to replace the religious doctrines they rejected. Their secularism persists in standard anthropology textbooks that even today echo the antimedieval *topos*. To cite just one instance:

> Medieval minds most often were turned inward to matters of theological concern, and for this reason non-Europeans were seen as souls to be saved and infidels to be conquered, rather than as people with customs to be described. The more distant a people were from Europe the more monstrous they became.[13]

It was never so simple; Enlightenment concerns produced their own credulous copyists. By uncritically repeating the charge that theology was narrow and medieval minds closed, current scholars perpetuate two fictions perhaps initiated by *philosophes* themselves—they project an integral European identity back into medieval (and Renaissance) times and they assume that exotic customs were inherently shocking before and during the Age of Discoveries. Both myths dissolve if we examine pre-Enlightenment sources in accordance with their own conventions. Here I mention only a few.

Before the uneven rise of a European identity over the seventeenth century, sectarian factions were rife. Religious and partisan interests and the civic/rustic distinction meant that commentators could easily feel as remote from doctrinal opponents or illiterate compatriots as from exotics. Distance from Europe was not yet a relevant factor in ideas of monstrosity. L. E. Huddleston reminds us that neither the idea of "Europe" nor of the "New World" explained Columbus's reactions to his discoveries:

> Columbus did not question the existence of men in the New World because he did not know it was a New World. The realization of this fact was a gradual one not fully made until the reports of the Magellan Expedition of 1519-1521 became available. There was, therefore, no reason to marvel at a New World filled with New Men because neither phenomenon was recognized as such.[14]

Moreover, Columbus first described Caribs almost prosaically: handsome, generous, and cleanly; displaying language, ingenious fishing technology, and monogamy; hence potential converts to Christianity. They were, in short, Indians, not cannibals. His earliest reports alluded to the natives' childlike simplicity when receiving trinkets, without, however, generalizing Caribs as the "childhood" of mankind. After these rather straightforward descriptions, Columbus's fuller interpretations later followed medieval and Renaissance styles of cross-cultural generalization. He advanced lively stereotypes of America, mingling the innocence of Adam and Eve (prior to sexuality, shame, and clothing) with classical idylls and antique monstrosities. Subsequent arguments over New World conditions identified them with both Paradise and biblical images of degradation: bedevilment, Nebuchadnezzar, and so forth.[15]

Such interpretations, then, were not ignorant and superstitious first impressions but overwrought second thoughts. For purposes of generalization, which required situating all populations in the Christian web of sin and salvation, Scripture worked at home and abroad. Below we shall see that, after Magellan, ethnological marvels reflect Protestant/Catholic rivalry rather than any lingering medievallike confusion and awe over aboriginal practices. The more elaborate style of stereotyping that can be found in Columbus will flourish in the Reformation as well. Moreover, sectarian divisions will delay formulating a clear and exclusivistic Europe/exotic dichotomy until religious reformism is transformed into nationalism and Enlightenment secularism.

Medieval and Renaissance views of cultural diversity appear merely superstitious and "theological" only if we forget, with *philosophes*, that ritual and doctrine occupied a special place in less "territorialized" pre-Enlightenment traditions. To compare adequately earlier views of *others* to Enlightenment views would require us to contrast the Middle Ages or Renaissance to the Enlightenment as total cultures. We would have to peruse the entire complex of institutional values and contrasting modes of citizenship, perhaps beginning with observations like R. W. Southern's:

> The identification of the church with the whole of organized society is the fundamental feature which distinguishes the Middle Ages from earlier and later periods of history. At its widest limits it is a feature of European history from the fourth to the eighteenth century—from Constantine to Voltaire. In theory, during the whole of this period only orthodox and obedient believers could enjoy the full rights of citizenship . . . [an orthodoxy itself evolving].
>
> In a word, the church was a compulsory society in precisely the same way as the modern state is a compulsory society. Just as the modern state requires those who are its members by the accident of birth to keep its law, to contribute to its defence and public services, to subordinate private interests to the common good, so the

> medieval church required those who had become its members by the accident (as one may almost call it) of baptism to do all these things and many others.[16]

Hence, the perceived threat of Anabaptists. Yet, apart from baptism and related evolving sacraments, theologians admitted extensive variation within Christendom, including a diversity of vernaculars. We could contrast to this broadmindedness the sort of Enlightenment uniformitarianism manifest in American rules of naturalized citizenship that demand strict "conversion" to American English. Given two cases of relative "sacramental intolerance" on the one hand and relative "linguistic intolerance" on the other, which is the more doctrinaire, the less objective? Christian ethnology, of course, stigmatized certain categories of mankind, including Ethniks, Tartars, and the always special case of Jews as "licensed enemies" implicated in principles of heresy. No question of tolerance here; yet it was not mere monolithic intolerance either. To overlook the diversity admitted even in negative medieval ethnological imagery is to ignore the social, political, and cultural context of church history and theological exegesis—not a very anthropological policy.

It is true that in many cultural domains, the so-called medieval mind—like any "mind," or rather *mentalité,* or rather culture—rejected certain possibilities. Concealing momentarily my ulterior comparativist motive, let me mention just three items the Middle Ages tabooed: specific intervals of the musical scale (*diabolus in musica*), simultaneous polygyny, and serial polygyny (divorce) as well. But against these restrictions we must consider what was allowed: polyphony, a trichotomy of monastic-ecclesiastic-temporal modes of authority, property, and legitimacy; a changing cosmology of love, including love of Church, love of lord, and eventually romantic love and/or sacramental marriage; and communal ascetic renouncers (anchorites), contrasted to the solitary renunciation that came to dominate Eastern reaches of related Indo-European religious traditions. The crucial comparative fact that motivates my choices is this: these very cultural complexities amalgamated within the theology of medieval Christendom could as well serve to set apart distinct cultures; in fact, today they *do* distinguish variant cultural patterns of Indo-European religions and societies.

If one were to brand an age as inward-turning and Europocentric, the Reformation and the Enlightenment are possibly better candidates than the Middle Ages, which resisted singular modes of authority, singular types of love, and singular, uniform standards of national languages and legal codes. Over thirty years ago A. L. Kroeber championed medieval pluralism in extradoctrinal matters:

> [During the Middle Ages] conformity to the Christian doctrine was exacted, but little else. In fact, controlled acculturation came late. Not until well into the modern period of European history, along with the rise of consciously nationalistic programs, did the inclination become strong to improve people of other culture and speech by inducing or forcing them to accept one's own.[17]

We might say, then, that one basic difficulty in comparing Enlightenment and medieval views of different cultures is this: compared to the uniformitarian Enlightenment, the medieval period *was* different cultures—like Herodotus's Egypt and Greece together, provided both be baptized.

What, though, of medieval and Renaissance recourse to superstitious monstrosities versus Enlightenment skepticism and caution? Did not the *lumières* at last outgrow that "tide of ethnological fantasy" Hodgen bemoans. Our case study will reveal as much evidence of exaggeration and nonobjectivity in Enlightenment formulaic generalizations as in those of the Renaissance. (I leave aside the issue of internal credulity for all eras.) But the same monstrosity serves two different styles of expressing cross-cultural diversity, both of them limited, but—and this is their anthropological interest—in different ways.

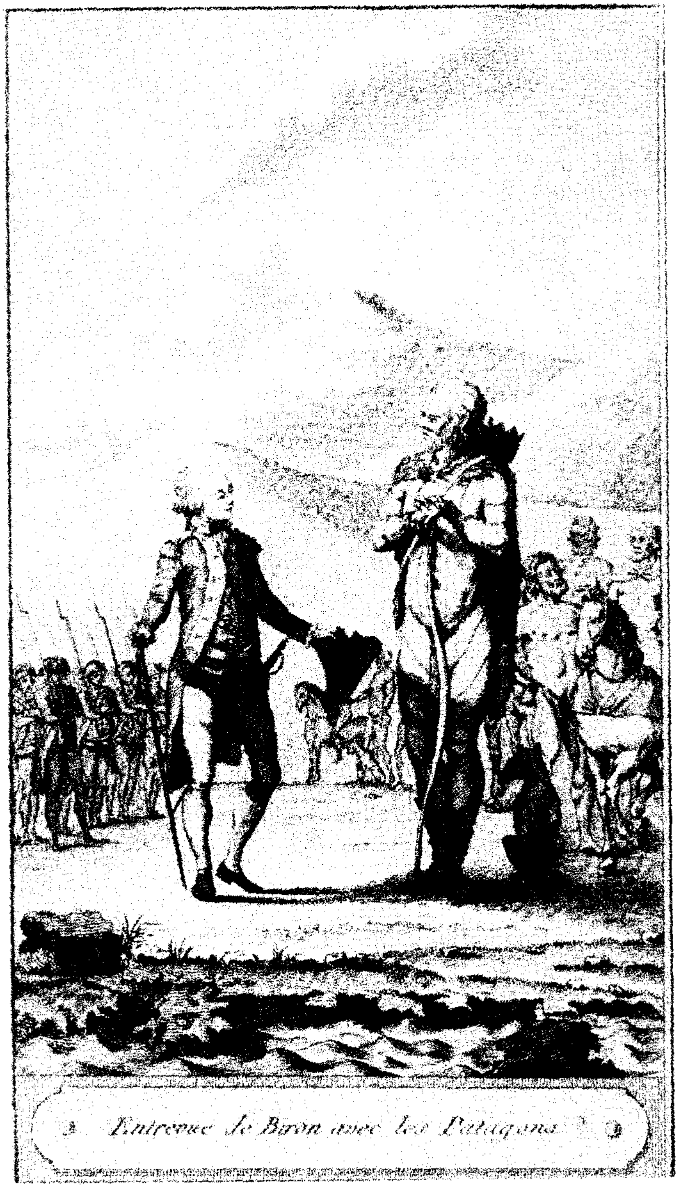
Patagonian Marvels: Pigafetta . . . Darwin . . . Sagan

In 1520 Magellan's chronicler Pigafetta inscribed the natives of Tierra del Fuego as Patagonians ("big feet"), thus initiating a major legend in the history of ethnology. Pigafetta's giants entered English in R. Eden's translation, edited by the Jacobean scholar, Samuel Purchas:

> They . . . sayled toward the Pole Antartike, where they found a great River of fresh Water, and certain Canibals. Of these, they saw one out of their ships, of stature as big as a Giant, having a voyce like a bull. . . .
>
> This Giant was so big, that the head of one of our men, of a nice stature, came but to his Waste. He was of good corporature . . . painted with divers colors, but for the most part yellow. . . .
>
> Shortly after, they saw another Giant. . . . he layd his hand on his head, and pointed up toward Heaven, and our men did the like. . . . This Giant was very tractable, and pleasant. He sung and danced, and in his dancing, left the print of his feet on the ground. Hee remayned long with our men, who named him John. Hee could well speake, and plainely pronounce these words, Jesus, Ave Maria, Johannas, even as wee doe, but with a bigger voyce.
>
> [Later when the Giants] saw how they were deceived they roared like Bulls, and cryed upon their great Devil Setebos, to helpe them. . . . They say, that when any of them die, there appeare ten or twelve Devils, leaping and dancing about the bodie of the dead . . . painted with divers colours. . . . One of these Giants which they tooke, declared by signes that hee had seene Devils with two hornes above their heads, with long hayre down to their feet; and that they cast forth fire at their throats both before and behind. The Captaine named these people Patagoni.[18]

No less than Columbus, Pigafetta's interpretations blended Old Testament antediluvian conditions, classical Cacotopian legends, and perhaps medieval satanic hybrids to generalize the image of Patagonians. I am concerned, however, less with his sources than his successors.

Sixteenth-seventeenth century Protestant scholars turned interpretations of diabolical gigantism back against their Catholic originators. To legitimate their own discovery, trade, and later colonization, Protestants identified cannibalism and other traits with Anti-Christ embodied in the Pope. Pigafetta's account, for example, was edited and annotated by Samuel Purchas, who in 1625 associated giants, sodomy, and Devil-worship with the league between the Spanish and Pope Alexander VI. Similar ideas were elaborated in De Bry's *Grand Voyages* published between 1590 and 1634. Bernedette Boucher's study *La Sauvage aux seins pendants* has recently decoded De Bry's iconography, which


Entrevue de Biron avec les Patagons

Frontispiece, J. P. Berenger, *Collection de tous les voyages faits autour du monde par les différent nations de l'Europe, vol. 5* (Geneva, 1788–1789).

construed New World discoveries in Protestant (Huguenot) terms of successive Falls and prelude to the Apocalypse—a kind of counter-Counter-Reformation ideology. If Amerindians were Edenic innocents before European contact, they then sustained a condensed version of Old World human tribulations. For De Bry's illustrators, the vehicle of this belated Fall is the Pope-backed Spanish conquest: a Devil-Serpent come lately. Prior to the Second Coming, a purge of these Spanish-engendered diabolical conditions would be effected by the settlement of Protestants in self-sufficient communities: orderly food producers and consumers, and endogamous. To ardent Protestants, nothing remote could appear more monstrous than the very proximate Papacy.[19]

Coined in the Renaissance, the term "Patagonian giants" thus persisted in late Reformation elaborations of New World history. Revisionist Protestants converted Scriptural similitudes to their advantage: Pigafetta's reports; Benzoni's accounts of Tupinamba cannibalism; notorious episodes in Acosta of Balboa's hurling Indian sodomists to ravenous dogs. Legends of giants and devils confirmed other signs of antediluvian sin presumably inflicted on prelapsarian Indians by the forces of Spain and Pope.

Physical gigantism among Patagonians was explicitly discredited and empirically disproved in 1670 by John Narborough. Yet, legends of giants reemerged the next century, this time framed within Enlightenment scientific generalizations rather than medieval or Reformation sectarian ones. H. Wallis helps us follow the complex episodes after Byron's famous visit in 1765:

> The first report of the encounter reached England on 22 June 1765 in Byron's letter to Lord Egmont written at Port Famine. This showed the Patagonians to be a race formidable indeed: "The stoutest of our Grenadiers would appear nothing to them. . . . Our People on Board, who were looking at us thro' their Glasses, said we looked like meer Dwarfs to the People we were gone amongst," Byron wrote, summing them up as "People, who in size come the nearest to Giants of any People I believe in the World." The Admiralty kept this remarkable information to itself. It was not until Byron's return in May 1766 that the sensational news of Byron's giants became the talk of Europe. The report that Byron had encountered men "of extraordinary bigness," "nine feet high," when passed on through French intelligence drew from the French Minister of Foreign Affairs, Praslin, the dry comment that Byron must surely have seen them through a microscope. The Royal Society Club discussed the news of the giants at one of its weekly dinners at the Mitre in July 1766, and Dr. Maty hastened to report the facts in a letter to M. de La Lande, President of the French Académie de Sciences. All Paris was amazed, as the Abbé Coyer sardonically reports, until on 1 August 1766 the French naturalist M. de La Condamine answered in a letter to the *Journal encyclopédique* that the story of the Patagonian giants was a fable, and that the English government had put the story about to conceal the real objective of the fleet of four ships then being made ready for South America—Wallis's ships and the *Swift*—the exploitation of a mine which the English had discovered.

We need not presume to judge whether the "Enlightenment mind" actually believed in the reports; gullibility or credulity (even of the "medieval mind"!) is perhaps impossible to prove from documentary evidence. I only want to emphasize how giants settled readily into an eighteenth century style of comparative generalization:

> The sudden outburst of news on Byron's return and the reticence of the crew do suggest that the British Government used the giants to divert attention from the

> more serious and controversial episode of Byron's voyage, the visit to the Falkland Islands. How far the Government actually believed the reports of the giants is not known, but the Royal Society under Maty's auspices apparently did, and publicized the reports with uncritical zeal. It is significant perhaps that when the crew did break their silence, the pronouncement came in the form of a letter to the Royal Society.[20]

Patagonian giants rematerialized in an implicit taxonomy of physical measures. A Renaissance—Reformation similitude of diabolical conditions was converted to an Enlightenment scheme of abnormal (unnatural) physicality. Like eunuchs, harems, and human sacrifice, giants too could be transformed, "with uncritical zeal," into Enlightenment methods of generalization through uniform measure.

The eighteenth century not only revivified an old ethnological fantasy; it paved the way for a host of subsequent distortions and exaggerations by converting allegorical Medieval-Renaissance-Reformation emblems to the style of visual representation developed in neoclassical aesthetics. Recall that in 1764 Byron had conveyed the "gigantic stature" of a Patagonian chief in prose and illustration. Our tale resumes in 1768 when Captain Cook embroidered Byron's account, deeming Fuegians "perhaps as miserable a set of people as are this day upon Earth." While verbal inscriptions leave open whether a people is circumstantially or typologically miserable, visual inscriptions (in the conventions of Enlightenment representation, as opposed to Medieval-Renaissance emblems) seem intrinsically typological and complete. It was according to neoclassical conventions that Cook's comment influenced a drawing by Buchan, who offers a visual scheme of Fuegian types: squalid but symmetrical.

Later the explorer Hawkesworth construed "misery" as "austerity"; he described the people as hard primitives, contemporary paragons of Spartan virtue (more Enlightenment similitudes!); and his illustrator followed suit. From this point the plot could only thicken; Bernard Smith helps us trace the transformations in visual conventions:

> If Hawkesworth's and Bank's accounts were colored by their classical learning and neo-classical romances like *Télémaque*, then, equally, Buchan's original drawing was falsified by the conventions of neo-classical artists. Buchan's drawing answers closely to a description of a Fuegian village written by Banks. Both men, doubtless, visited the village at the same time.
>
> Cipriani made extensive alterations in redrawing Buchan's sketch evidently to bring it into line with Hawkesworth's interpretation of the Fuegians. He has made the six squalid figures in the sketch more comely and graceful . . . transformed . . . into the state of primitive elegance imagined by Hawkesworth. . . . Falsified as the engraving was it provided none the less a model for later illustrators of Pacific voyages. A degraded form of Cipriani's design appears, for instance, in an 1843 account of Cook's voyages. The two little naked amorini have been discreetly removed as befitted an account written with an eye upon evangelical opinion. And the landscape setting has been transformed from [Salvatore] Rosa's picturesque sublimity to the coconut palms of a tropical Elysium, despite the fact that the latitude corresponded to Britain's, that it was a land of beech . . . and birch . . . and the weather so severe when Cook was first there that snow fell in January and two . . . servants perished from exposure to the cold.[21]

Yet half a century later Cipriani's figures still served to represent the shivering inhabitants of Patagonia, who had perhaps been better off interpreted as giants.

Distortions generated by the Enlightenment persisted through Darwin's famous visit to Tierra del Fuego in 1832. Taxonomic schemes and "naturalized" models of cultures shifted smoothly from Enlightenment charts of savage/civilized into evolutionary sequences up from the primitive.

Foremost among the victims of these embellishments on an Enlightenment style were the Patagonians and Fuegians themselves. Darwin's portrayal set the tone of "scientific" cultural comparisons for the next century and beyond:

> The astonishment which I felt on first seeing a party of Fuegians on a wild and broken shore will never be forgotten by me, for the reflection at once rushed into my mind—such were our ancestors. These men were absolutely naked and bedaubed with paint . . . their expression was wild, startled and distrustful. . . . He who has seen a savage in his native land will not feel much shame, if forced to acknowledge that the blood of some more humble creature flows in his veins. For my own part, I would as soon be descended from that heroic little monkey, who braved his dreaded enemy in order to save the life of his keeper; or from that old baboon who, descending from the mountains, carried away in triumph his young comrade from a crowd of astonished dogs—as from a savage who delights to torture his enemies, offers up bloody sacrifices, practices infanticide without remorse, treats his wives like slaves, knows no decency, and is haunted by the grossest superstitions.
>
> Man may be excused for feeling some pride at having risen, though not through his own exertions, to the very summit of the organic scale; and the fact of his having thus risen, instead of having been aboriginally placed there, may give him hopes for a still higher destiny in the distant future.[22]

To argue the descent of man from monkey, Darwin posed a radical disjunction between Fuegian and European, between their past and our present, and between our present and some standard ameliorated future.

Darwin's optimism and his post-Enlightenment uniformitarian standards (presumably natural) for measuring cultures survived, whether fit or not, in evolutionist thinking; they are still influential. To take a recent example, the above passage from *The Descent of Man* forms the initial epigraph of Carl Sagan's celebrated study of the nature and future of human intelligence, *The Dragons of Eden*. The book, which ends with designs for extraterrestrial scientific communication, begins with Darwin on Fuegians. Sagan's later acknowledgements of inadequacies in the view are themselves inadequate:

> Darwin was, of course, a man of his times and occasionally given—as in his remarks on the inhabitants of Tierra del Fuego quoted above—to self-congratulatory comparisons of Europeans with other peoples. In fact, human society in pre-technological times was much more like that of the compassionate, communal and cultured Bushman hunter-gatherers of the Kalahari Desert than the Fuegians Darwin, *with some justification*, derided.[23] (*italics added*)

What justification, even partial, was there to Darwin's derision? His information on Patagonians and Fuegians stemmed from a Renaissance similitude (biblical giants) eventually converted into an Enlightenment taxon (species-giants) and subsequently transformed into neoclassical images of everything from Spartan to Italianate. Darwin's description merely echoes the stereotype of *natural* wretchedness (plus, it seems, a dash of diabolicalness) we traced above. By reading further either on Fuegians or in Darwin, Sagan might have discovered abundant reason for denying any objective justification whatsoever for Darwin's evolutionist opinions of these primitives, which were reinforced by a distinctly nonempirical source:

> While going one day on shore near Wollaston Island, we pulled alongside a canoe with six Fuegians. These were the most abject and miserable creatures I anywhere beheld. . . . [They] were quite naked . . . stunted in their growth, their hideous faces bedaubed with white paint, their skins filthy and greasy, their hair entangled, their voices discordant, and their gestures violent. Viewing such men, one can hardly make one's self believe that they are fellow-creatures, and inhabitants of the same world. We often try to imagine what pleasure in life some of the lower animals can enjoy: how much more reasonably the same question may be asked concerning these barbarians!
>
> The Fuegians of Good Success Bay are a very different race from the stunted, miserable wretches farther westward; and they seem closely related to the famous Patagonians of the Strait of Magellan. . . . Their skin is of a dirty coppery-red color. Their chief spokesman, an old man, had a . . . face . . . crossed by two broad bars: one, painted bright red, reached from ear to ear, and included the upper lip; the other, white like chalk, stretched above the first. . . . His two companions . . . were ornamented by streaks of black powder, made of charcoal. The party altogether closely resembled the devils which come on the stage in plays like "Der Freischütz."[24]

Here Darwin interprets the taller inhabitants of Tierra del Fuego across similitudes from Romantic drama and opera. Pre-Enlightenment methods lingered on. And perhaps neither Sagan nor any of us can finally escape them; but we can avoid confusing our own bases of conceptualizing others with nature, objectivity, or uniform reason.

Finally, the unacknowledged complexities behind the cross-cultural stereotypes that begin Sagan's book might even cast an anthropological shadow over the extraterrestrial stereotypes concluding it. Having commenced with Darwin, *The Dragons of Eden* ends with the highly publicized illustration of a man and a woman *au naturel,* duly measured, his hand raised in greeting to some unknown recipient of their intended message. This is the visual representation of the human species NASA mailed to aliens anonymous to inform them of our nature. Sagan made a token comparison of the man's gesture across cultures (the Sioux) to confirm that, terrestrially speaking, it is standard. Pausing to wonder, "Could the significance of the man's gesture be deduced by beings with very different biologies," Sagan never questions whether this whole image—part of the "first artifact of mankind to leave the solar system"—would communicate as intended even to different cultures or eras.[25]

The picture of earthlings transmitted by *Pioneer 10-11* was fabricated with Enlightenment-like simplicity: "in what is hoped is easily understood scientific language" to convey "some information on the locale, epoch, and nature of the builders of the spacecraft." Let us imagine, however, that the message, devised in Enlightenment-style conventions, is received according to conventions no more alien than those that have divided earthlings (with the same biology). Imagine that extraterrestrials resemble the natives of NASA in all respects save one: they employ pre-Enlightenment interpretation. If we imagine as well that subtexts are shared (unlikely, I confess), Sagan's message would communicate clearly that earthlings are, of all things, innocent, nonprocreating prelapsarians (evidently childless, and naked). Imagine now *their* surprise if ever they should land! Or, in the more likely free-thinking event that (biologies aside) subtexts also differ, however understanding occurs, it won't be "easily."

I have toyed with Carl Sagan's assumptions and designs in order to highlight the crux of comparative anthropology: earth's own diversity of cultures (and eras) is as mind-bending as a speculative diversity of natures. Moreover, can we imagine with contemporary *philosophes* that communication across galaxies might be simpler, more direct, less symbolically contorted than communication across cultures? "Shades," snorts the anthropologist, "of science fiction."

Chiaroscuro

Because the Middle Ages and often the Renaissance have been derided in standard histories of anthropology, I have attempted reciprocally to debunk an Enlightenment method of cross-cultural reductionism still very much with us. The exercise readily calls to mind Herder's early Romantic insistence that

> assimilation to a single universal pattern, of laws or language, or social structures, as advocated by the French *lumières*, would destroy what is most living and valuable in life and art. . . . Hence, too, the attack on Sulzer for demanding a universal philosophical grammar, according to the rules of which one would be enabled to judge of the degree of the perfection/standardization of a people's language, and, if need be, correct its rules in the light of the universal rules. . . . It is terrible arrogance to affirm that, to be happy, everyone should become European.[26]

But, taken no further, Romanticism remains reactionary—an apotheosis of diversity yet to become a theory of variation or a method of comparison.[27] Nineteenth century modes of description were enriched through Romantic interest in local color and remote regional and historical lifestyles. But its scientific generalizations retained abstract taxonomic schemes, shifting, for instance, a savage/civilized distinction to the child-savage theme pervasive in Social Darwinism and Victorian paternalism. B. V. Street writes:

> [Despite] later nineteenth century accounts of "savages" and the Darwinian struggle of primeval man . . . the comparison of the savage with the child lived on with a new meaning. If, as anthropological theory held, the primitive races represented a previous stage in the development towards "civilized" man, then the model of a child growing into a man could be applied to human evolution, with the European races as the mature and fully developed men and the primitive races as "children." Thus, the "parent" races are obliged to treat their child-like charges with the care and control of a Victorian father.

Evolutionism embroidered Enlightenment abstract contrasts into a texture of fantastic stereotypes. Had the images not been thought to chart natural differences, one might almost call them ultramedieval:

> That natives can't make logical short cuts, that savage people and jungle-beasts alike have an ability to sleep at will, that natives have cunning infantile minds, that they are fatalistic and have a sixth sense. . . . And Wallace describes the natives Sanders encounters as "having a liking for forbidden fruit, a penchant for

> triviality, a prescience "which is every aboriginee's birthright," and a sense of telepathy.[28]

Childlike or subhuman? Wretched or Spartan? Prophetic or superstitious? Whichever, evolutionists, like certain *philosophes,* assumed that the complex, exaggerated impressions produced by cultures and languages in contact could be charted as natural, measurable differences. Against such assumptions Franz Boas would direct his antievolutionist theory of culture, continued in the anthropology of Robert Lowie, Alfred Kroeber, Edward Sapir, Ruth Benedict, and their successors.

A shadow of the pre-Enlightenment enriched Benedict's unsurpassed *Patterns of Culture* (1934). Although moralistic in tone, her vision was more paradoxical and self-ironic than later reputed. Doubting a simple future of enlightened tolerance through universal conformity to a uniform human nature, she professed resignation, unsparing and prophetic:

> Primitive man never looked out over the world and saw "mankind" as a group and felt his common cause with his species. From the beginning he was a provincial who raised the barriers high. . . .
>
> So modern man, differentiating into Chosen People and dangerous aliens groups within his own civilization genetically and culturally related to one another as any tribes in the Australian bush are among themselves, has the justification of a vast historical continuity behind his attitude. The Pygmies have made the same claims. We are not likely to clear ourselves easily of so fundamental a human trait, but we can at least learn to recognize its history and its hydra manifestations.[29]

Benedict implied that *all* cultures and eras can foster both unwarranted esteem and undue contempt for portions of mankind, themselves and others. From the high moral arrogance of the Enlightenment, eventually separating each type of the human species measurably from the other, she advanced to a cross-cultural chiaroscuro, extending to ourselves.

Comparative anthropology is caught between eras just as it is caught between cultures. Extracting ourselves from Enlightenment-style formulations lands us in pre-Enlightenment interpretation; and circumspect distance from the latter reinsinuates Enlightenment abstraction. The Enlightenment fabricated a geographically and "naturally" remote *other* as exotic antithesis to itself. The pre-Enlightenment argued both the best and the worst—the perfected and the damned—wherever the sectarian brethren and enemies were perceived, exotically or intimately: Patagonian or Pope.

Michèle Duchet touches a vital issue in Enlightenment anthropology: "For a society which doubts its own values and powers the occasion arises to put itself in question, to think of itself other than it is, to invent its own negation, so better to measure its alienation."[30] Our questions then become: Did the Enlightenment actually put its society in question against its own uniformitarian abstractions? How does this compare to interpreters who put their society in question against values of divineness/diabolicalness? Is the Enlightenment to be distinguished from other eras, anthropologically, less for its dialectical self-doubt than (taking Duchet more literally than she perhaps intended) for its confidence that its own alienation could be measured, uniformly removed from all cultures and all times? Was that article of faith, at least, inalienable?

After Herder, Romantic ideals of translation revived interest in hermetic codes, lost languages, Ur-Sprache, and related pre-Enlightenment concerns.[31] Yet, evolutionary science continued Enlightenment traditions of charting cultural differences as naturalistic taxons. For all its excesses and faults, medieval-Renaissance interpretation—culminating in a "Theater of the World" of ritual and religious rarities and varieties—avoids this particular type of reductionism that joins Enlightenment *philosophes* to our current scientific optimists.[32]

We have traced European misconceptions in our tale of Patagonia. Reciprocally, it is just as certain that Patagonians and Fuegians misconceived Europeans: again, neither we nor they "are likely to clear ourselves easily of so fundamental a human trait." A less obvious complication is that Europeans retrospectively misconceived themselves in the act of encountering Patagonians. A French illustration of 1790, for instance, depicts Byron and his men (1764) as orderly, symmetrical observers of natives more shadowy and diversified (and larger!) than they themselves. Europeans inscribed Patagonians as, of all things, giants, and themselves as, of all things, Enlightened. Both sides of the inscription are equally distorted, because cultures, like historical styles, interpenetrate symbolically.

A tragically nonsymbolic fact is that by the 1870-1880s, when long-term contacts were beginning, the inhabitants of Tierra del Fuego, now designated the Yaghan and the Ona, had been largely eradicated by European disease. Yet, even under happier circumstances, it would have been the symbolic facts that influenced views of Patagonians and Fuegians from Pigafetta on through Darwin *et al.*

The history of anthropology and the anthropology of history happen symbolically. Had American aboriginals—some taller than others but all naturally normal-sized—lived fully clothed, they could still have been construed as exotic. (And we must remember that they were only eventually construed as such, although many went naked; assuming *Pioneer 10-11's* message is received by some infinitely remoter *other*, next time it's our turn!) Or setting our sights at a more mundane (terrestrial) level: isn't it time for the Enlightenment to appear equally as exotic to us now as Patagonians appeared to them then?

Knowledge of other cultures and eras depends on the cultures and eras doing the knowing. This fact should not obstruct but should constitute comparative anthropology throughout history. Because these limits cannot be transcended, they must be incorporated in our theories. What better place to acknowledge the limits than in the history of cultures that understand each other imperfectly? The same limits might also give pause to message-senders of all eras, including our own, by allowing us to recognize ourselves as not-inevitable. It is the mysteriously durable Enlightenment dream of direct, uniform knowledge communicated easily—independent of cultures, eras (or galaxies)—that certain schools of anthropological interpretation salutarily doubt.

Enlightenment simplicity imagined an unencumbered vantage on cultures and eras, external to all of "them." It imagined as well that Patagonians were measurable, rather than Scriptural, giants; or naturally symmetrical; or intrinsically wretched. If Enlightenment objectivity did no better by Patagonians and Fuegians than did the Renaissance, why should we voice confidence in one over the other? Patagonians and Europeans alike were masters and victims of historical cultures, both exaggerated with reference to each other, and neither exaggerated with reference to nature's norms. (We may say the same of the Renaissance and the Enlightenment.) Anthropologically, there's the marvel.

By cutting both Patagonians and the Enlightenment down to comparative size, we may (Enlightenment-like?) outgrow superstitions of uniform, unmediated objectivity across cultures. But even as I profess this symbolic hope, I feel its historical culture slipping out from under it, with no more likelihood of survival than Patagonian giants or Patagonians themselves—whatever they might have been, had we known.

REFERENCES

[1] This essay suggests themes in symbolic and structuralist approaches to cross-cultural comparison developed in *Other Tribes, Other Scribes: Symbolic Anthropology and the Discourse of Cultures*, forthcoming. Olivian Boon, Johannes Fabian, Stephen Graubard, Wendy O'Flaherty, Bobby Paul, Judith Shklar, and many others at Emory University's conference on "The Limits of Knowledge" provided valuable advice for this version. The opening quotation is from Arthur O. Lovejoy, *The Great Chain of Being* (Cambridge, Mass.: Harvard University Press, 1964), p. 23.

[2] Clifford Geertz, *The Interpretation of Cultures* (New York: Basic Books, 1973), p. 52.

[3] Perhaps the most extreme *surestimation* of Enlightenment anthropology is by Marvin Harris: "All that is new in anthropological theory begins with the Enlightenment. . . ." *The Rise of Anthropological Theory* (New York: Crowell, 1968), p. 9. Harris feels Locke and Montesquieu discovered that "the mechanisms responsible for sociocultural transformations" were "purely natural expressions of cause and effect relations," and he builds his own cultural materialism on this assumption. For an alternative view see John Howland Rowe, "The Renaissance Foundations of Anthropology," *American Anthropologist*, 67 (1965): 1-14. See also *Readings in the History of Anthropology*, Regna Darnell (ed.) (New York: Harper & Row, 1974).

[4] Lovejoy, *The Great Chain of Being*, p. 9.

[5] I am not addressing the strengths of Enlightenment philosophy in natural science, political theory, or companion topics in the difficult works of Montesquieu and especially Diderot and Rousseau; rather, I locate an *esprit simpliste* in cross-cultural formulations, limited in the Enlightenment as in previous eras. Nor do contemporary formulations (including my own) escape their respective cultural limitations.

[6] Margaret T. Hodgen, *Early Anthropology in the Sixteenth and Seventeenth Centuries* (Philadelphia: University of Pennsylvania Press, 1971), pp. 102-3. Similar standards characterize Annemarie de Waal Malefijt, *Images of Man: A History of Anthropological Thought* (New York: Knopf, 1974).

[7] Herodotus, excerpted in A. L. Kroeber and T. T. Waterman (eds.), *Source Book in Anthropology*, rev. ed. (New York: Harcourt Brace, 1931), p. 3-4.

[8] George Steiner, *After Babel: Aspects of a Theory of Translation* (New York: Oxford University Press, 1973), p. 59. Other recent helpful works on pre-Enlightenment and pre-Baconian interpretive traditions include Mircea Eliade, *The Forge and the Crucible*, sec. ed. (Chicago: University of Chicago Press, 1978); and all the books of Frances Yates—for example, *The Rosicrucian Enlightenment* (London: Routledge and Kegan Paul, 1972). See also Harry Levin, *The Myth of the Golden Age in the Renaissance* (New York: Oxford University Press, 1969); and the works of Frank E. Manuel, most recently with Fritzie P. Manuel, *Utopian Thought in the Western World* (Cambridge, Mass.: Harvard University Press, 1979).

[9] Voltaire, cited in Lovejoy, *The Great Chain of Being*, p. 290. Lovejoy contends that Bolingbroke's assumption of a universal and unvarying code was "the root from which grew most of the principles of neo-classical criticism." For a fuller sense of such principles, see Peter Gay, *The Enlightenment: An Interpretation*, 2 volumes (New York: Knopf, 1966). The verse cited translates: Uniform morals always, everywhere / It is the law of Plato, Socrates, and yours / Nature is the apostle of this eternal worship / This soverign law in Europe, in Japan / Inspired Zoroaster, enlightened Solomon.

[10] Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Vintage Books, 1973), pp. 62-63.

[11] I am vastly simplifying Foucault's broad contrast between implicit epistemological structures (*épistémès*) of the Renaissance (roughly fifteenth-sixteenth centuries) and the French classical period (roughly seventeenth-eighteenth centuries). Foucault's "epistemes" convert historicist concepts of eras and epochs to more intellectualist and dialectical constructs. Something like a paradigm or even

a grammar, an episteme, unquestioned from within its assumptions, comprises the "conditions of possibility" of interrelating knowledge under distinct historical conditions. Epistemes are systematic, holistic, and contrastive—each a thorough transformation of the other: like the linguist's "*langue*" and the anthropologist's "culture," but with respect to the history of ideas. In my reading, an "episteme" is a "culture" of time.

[12] Michèle Duchet, *Anthropologie et Histoire au siecle des lumières* (Paris: Francois Maspero, 1971), pp. 377-8, 381. Georges-Louis de Buffon, *De l'homme* (Paris: Masparo, 1971). The passage quoted is my translation.

[13] Wendell Hillman Oswalt, *Other Peoples, Other Customs: World Ethnography and its History* (New York: Holt, Rinehart & Winston, 1972).

[14] Lee E. Huddleston, *Origins of the American Indians: European Concepts, 1492-1729* (Austin: University of Texas, 1967), p. 5.

[15] Hodgen, *Early Anthropology*, ch. 8. See also J. H. Elliott, "The Discovery of America and the Discovery of Man," *Proceedings of the British Academy*, 1973. For sources from Columbus, see Björn Landström, *Columbus* (New York: Macmillan, 1966). On the Indian/cannibal distinction, see the recent review of this and related concepts by Ronald Sanders, *Lost Tribes and Promised Lands* (Boston: Little, Brown, 1978).

[16] Richard W. Southern, *Western Society and the Church in the Middle Ages* (London: Penguin Books, 1970), pp. 17-18.

[17] A. L. Kroeber, *Anthropology: Cultural Patterns and Processes* (New York: Harbinger Books, 1963), p. 242. My allusions to Indo-European traditions and ideology rely on the sweeping comparative studies of Georges Dumézil, *Mythe et épopée* (Paris: Gallimard, 1966-1971).

[18] Samuel Purchas, *Hakluytus Posthumus or Purchas His Pilgrimes in Twenty Volumes* (Glasgow: James MacLehose and Sons, 1907), vol. 2, pp. 86-89.

[19] Bernedette Boucher, *La Sauvage aux seins pendants* (Paris: Hermann, 1977). I treat these arguments and one of the pre-Enlightenment historical contexts sustaining them at greater length in "Jacobean Ethnology: Indic Kings and Tribal Vagabonds in *Purchas His Pilgrimes,*" forthcoming, in the series on East-West Cultural Impact, Cornell University's Society for the Humanities, 1978-79.

[20] Helen Wallis, "The Patagonian Giants," in *Byron's Journal of his Circumnavigation, 1764-1766*, Robert E. Gallagher (ed.) (New York: Cambridge University Press, 1964), pp. 186-8.

[21] Bernard Smith, *European Vision and the South Pacific, 1768-1850* (Oxford: Clarendon Press, 1960), p. 23.

[22] Charles Darwin, *The Origin of Species and the Descent of Man* (New York: Modern Library), pp. 919-20.

[23] Carl Sagan, *The Dragons of Eden: Speculations on the Evolution of Human Intelligence* (New York: Ballantine Books, 1977), p. 6.

[24] I cite Darwin here from a collection of excerpts from *The Voyage of the Beagle* edited for children in 1873: *What Darwin Saw* (New York: Weathervane Books, n.d.), pp. 99-100, 93-94.

[25] Sagan, *The Dragons of Eden*, p. 246.

[26] Isaiah Berlin, *Vico and Herder* (New York: Viking, 1976), p. 196.

[27] I have elaborated similar ideas in *The Anthropological Romance of Bali, 1597-1972: Dynamic Perspectives in Marriage and Caste, Politics and Religion* (New York: Cambridge University press, 1977), part 1, ch. 9. The history of ideas of Bali are particularly instructive. In 1597-98 this complex, literate civilization was inscribed by the first Dutch visitors, who employed similitudes of widow-burning (in analogy with customs in Portuguese Goa) and orderly irrigation (in analogy with Holland's new canal systems). Both images contained a degree of ethnographic accuracy. Yet they were coined in pre-Enlightenment terms, and my point is that neither positive (Eden, irrigationist) nor pejorative (Nebuchadnezzar, widow-burning) similitudes of exotics wholly parcelled the human species into measurably separate types. Rather, they applied sectarian polarities universally.

[28] Brian V. Street, *The Savage in Literature: Representations of "Primitive" Society in English Fiction, 1858-1920* (London: Routledge and Kegan Paul, 1975), pp. 68, 75.

[29] Ruth Benedict, *Patterns of Culture* (Boston: Houghton Mifflin, 1961), pp. 7-8.

[30] Duchet, *Anthropologie et Histoire*, p. 11.

[31] See James A. Boon, "An Endogamy of Poets and Vice Versa: Exotic Ideals in Romanticism/Structuralism," *Studies in Romanticism* 18 (3) (Fall 1979): 333-361.

[32] Boon, "Jacobean Ethnology." On other complexities in New World imagery, see Fredi Chiappelli (ed.) *First Images of America* (Berkeley: University of California Press, 1976); and Hugh Honour, *The New Golden Land* (New York: Pantheon, 1975).

WENDY DONIGER O'FLAHERTY

Inside and Outside the Mouth of God: The Boundary between Myth and Reality

1. *Introduction*

DO MYTHS REMIND US of passionate moments in life, or are those moments compelling because they remind us of myths? This is no longer a burning question in the study of mythology, in part because we despair of ever answering it and in part because it has gone out of fashion. For, ever since the massive takeover of mythology by the social science cartel, myths have been set to work at practical rather than spiritual tasks, while, on the other hand, contemporary theologians in their intellectual mufti are embarrassed by a formulation that cuts so close to the bone of ontology, to the question of whether or not there really is anything "out there," and, if so, what it is.

But *within* the myths this has always been, and still is, an issue of great moment, and it has fascinated a line of scholars that extends from Plato through Jung to Eliade. In returning to this basic question about the nature of mythology, I will both challenge and stretch the insights of these scholars, while locking horns, *en passant*, with the social scientists and their theory of the function of myth as social charter. Moreover, I hope to show that even those who (like Freud) have denied the validity or value of myth, or who (like Claude Lévi-Strauss) see its function in logical rather than irrational constructions of reality, can contribute greatly to our understanding of the irrational truth of myth. Finally, it is my contention that recent speculations by natural scientists about what is "out there," as well as about the mechanism of memory in the human brain (i.e., "in here"), allow us to take seriously the assertion of myths not only that there is indeed something out there, but that it may be far more "there" (in the sense that, as Gertrude Stein remarked about Oakland, there is no "there" there) than what is normally referred to as reality.[1]

There are as many definitions of myth as there are mythologists, and as many definitions of reality as philosophers, and I do not intend to pick a fight with any of them at this point. In this essay I will make use of several overlapping but not, I think, contradictory definitions of myth and reality; definitions of myth, like myth variants, build up a composite image of something that cannot be said once and for all.[2] Moreover, since the very point of many of the texts I will be using is that one is forced to modify radically one's definitions of myth and reality in midstream, I will often use the terms in one sense at the beginning of a passage and in a very different sense at the end. I hope the context will guide the reader when the ambiguities become dizzying, and if I stretch the words beyond their normal usages, I will, like Humpty Dumpty, try to pay them extra.[3]

If we cannot pin down our definitions of myth and reality, we can at least indicate the general area in which the terms vibrate, like a group in set theory or the atoms of a table in the theory of indeterminacy. Reality, also known as material or historical existence *("Wie es eigentlich gewesen ist")*, generally refers to the phenomenal physical world that is the hunting ground of the natural sciences (though myth often poaches on it[4]). It is also roughly equivalent to common sense, "common" in that it is agreed upon by most sane people, and "sense" in that it is rationally apprehended by sight, touch, and so forth, and can be measured or mapped in standard units of time and space. Reality to each of us is the span of existence that we live through and perceive. Though myth, too, is "common" in that it uses recurrent, traditional, shared imagery (and may in fact provide the most reliable link between individual perceptions of reality[5]), it is both "uncommon" and "non-sense" in that it draws upon highly personal (albeit universal) experiences and expresses them through a medium that is neither rational nor methodical but rather imaginary or metaphysical. Where memory and science have been described as cognitive maps (of the "real world"),[6] myth is a cosmic map of the intersecting territories of reality and fantasy.[7]

Just as it is possible to find a linguistic prototype by tracing back historic lines until they converge,[8] so too we may seek the realm of myth by following certain convergent lines. That we attempt to translate myths from one culture to another implies the presupposition of a common core not only of experience, but also of the symbolic system to express that experience. We map out one territory from the study of symbolic systems (poetry, ritual, theatre) and another from our awareness of human experience (our own and what we learn from history, psychology, anthropology), and where they intersect is the land of which myth is the map.

It is not necessary, I think, to postulate a collective unconscious in order to explain the uncanny recurrence of certain figures in this landscape, enduring motifs for which "archetypes" is probably as good a word as any, and one hallowed by a usage stretching back beyond Plotinus. It is, however, necessary to understand the ways in which myth and reality intersect, or, rather, to understand the ways in which we presuppose that myth arises from a common understanding or experience of reality.

Archetypes are not myths; they are elements within myths, and they occur in other symbolic modes as well, particularly in those that aspire to achieve what myths often achieve. In our secular world, the myths that express our fusion of fantasy and reality are found not only in the remains of ancient sacred scriptures, but also in dreams, the theatre, films, in stories told to children, in works of art, and, most of all, in our own actual experience.[9] One might view these various expressions as being ranged on a continuum of common sense or agreed criteria of validity, between reality and imagination, spanning (from the "hard" end) science, history, and anthropology, through drama, ritual, film, and literature, to (at the "soft" end) dreams and personal fantasy. Myth and personal experience are incorporated to greater or lesser degrees in all these forms of cognition.

My analysis of myth turns on the question of limits (the pivot of all the articles in the present symposium) in two ways. "Limit" may be construed as a barrier to human understanding or as a borderline between two adjacent territories. By defining myth in the second of these senses, as a boundary line where fantasy and reality meet, I hope to show how it may be used in the first sense, as a place where an apparent barrier to human understanding may be forded or breached by the translation of one person's reality into another's through the mediation of myth.[10] To this end, I have selected from the great variety of myths a few that deal explicitly and self-consciously with the question of intersecting levels of myth and reality. Though I will limit myself primarily to the Indian, Greek, and Shakespearean myths that I know best, the reader will surely recall his own favorites that tell a very similar tale; that resonance is precisely the point of this essay.

2. *The Unreality of Reality: Myths of the Mouth of God*

Myths that apply "scientific," common sense criteria to apparently mythic, imaginary phenomena and myths that lay bare the magical nerve in apparently everyday phenomena are two complementary genres. We will begin with the second type, that peels back the cover from ostensibly "real" experience, and progress from there to the reality of ostensibly "mythic" experience.

Myths of the second type often make use of the image of entering the mouth of God. Such a myth is the story of Krishna and Yashodha:

> One day when the children were playing, they reported to Yashodha, the mother of Krishna (who was an incarnation of the god Vishnu), "Krishna has eaten dirt!" Yashodha took Krishna by the hand and scolded him and said, "You naughty boy, why have you eaten dirt?" "I haven't," said Krishna. "All the boys are lying. If you believe them instead of me, look at my mouth yourself." "Then, open up," she said to the god, who had in sport taken the form of a human child, and he opened his mouth.
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> Then she saw in his mouth the whole universe, with the far corners of the sky, and the wind, and lightning, and the orb of the earth with its mountains and oceans, and the moon and stars, and space itself; and she saw her own village and herself. She became frightened and confused, thinking, Is this a dream or an illusion fabricated by God? Or is it a delusion in my own mind? Or is it a portent of the powers of this little boy, my son? For God's power of delusion inspires in me such false beliefs as "I exist," "This is my husband," "This is my son." When she had come to understand true reality in this way, God spread his magic illusion in the form of maternal love. Instantly Yashodha lost her memory of what had occurred. She took her son on her lap and was as she had been before, but her heart was flooded with even greater love for God, whom she regarded as her son.[11]

Hindu myths of this sort pull the carpet out from under reality by lifting the barrier expressed by the image of the mouth of God. On the narrative level of myth, in which gods participate as dramatis personae, the world of events occurring outside the mouth of God is regarded as real, a common sense world with one moon and one sun in the sky. But we do not remain on this level for long. When the myth of Yashodha opens, we think we know what reality is; it is the life of a harried mother with her mischievous child. Then, suddenly, when she glances into the mouth of the child, we learn that the child is God, and that inside his mouth there is a world that appears to be mythical or at least unreal (since it replicates the world that we have assumed to be uniquely real). Yashodha cannot sustain the vision of that world; she cannot bear the idea that *that* might be reality. She thinks it may be a dream or a hallucination of her own making, or an illusion or portent sent by God. We who read the myth know it is the fourth of these options, as well as an inversion of the third: the *rest* of her life is an illusion, as she herself realizes while gazing inside the mouth of God. This illusion is *maya*, the divine magic that makes the phenomenal world seem real to us when, in the view of classical Hindu philosophy, it is not. Out of pity for her in her fear and confusion, Krishna erases the vision of reality and substitutes for it the illusion that he is not God but merely her son. This illusion is made of maternal love.[12]

The child plays an important role in another myth about the mouth of God:

> After Vishnu burnt the universe to ashes at doomsday and then flooded it with water, he slept in the midst of the cosmic ocean. The sage Markandeya had been swallowed by the god and roamed inside his belly for many thousands of years, visiting the sacred places on earth. One day he slipped out of the god's mouth and saw the world and the ocean shrouded in darkness. He did not recognize himself there, because of God's illusion, and he became terrified. Then he saw the sleeping god, and he was amazed, wondering, Am I crazy, or dreaming? I must be imagining that the world has disappeared, for such a calamity could never really happen. Then he was swallowed again, and as soon as he was back in the belly of the god, he thought his vision had been a dream.
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> So, as before, he roamed the earth for hundreds of years, and then again he slipped out of Vishnu's mouth. This time he saw a little boy hidden in the branches of a banyan tree, a boy who blazed so like the sun that Markandeya could not bear to look at him. I think I have seen this once before, mused the sage. I think I'm being fooled by the illusion of God. In confusion and terror, Markandeya began to swim away, but Vishnu said, "Do not be afraid, my son. Come here. I am your father." Markandeya bowed to him with love, and Vishnu taught him His true nature and commanded him to return inside His belly. Then Vishnu swallowed Markandeya once more, and the sage lived there in peace, longing to hear again the true nature of God.[13]

Like Yashodha, Markandeya at first thinks that some sort of illusion is being foisted upon him, and, like her, he gets it backwards: when he falls out of the mouth he feels he has entered an illusion, not knowing he has just escaped from the illusion. Both Markandeya and Yashodha think that God is a child and that they themselves may be dreaming or crazy.

But the myth of Markandeya goes on to develop a view that is the inverse of the myth of Yashodha. Ultimately, Markandeya understands the truth of the vision and becomes identified with the enlightened narrator of the myth. As the myth progresses, the protagonist is gradually released from his delusions; he discovers that God is not (or not merely) a child, whereas the persistent belief that God is her child continues to ensnare Yashodha. For her, the experience of the real hierophany takes place inside the mouth; for him, it takes place outside the mouth. The actual starting point is arbitrary, for the point of the enlightenment is the transition, the motion across the threshold—in either direction. But Markandeya continues to move back and forth between the two worlds until he ends up with the double image of both at once, while Yashodha's momentary experience of a new reality is never repeated, and she rejects it permanently.

Since she is a woman, and a mother, she cannot live for long on the plane of metaphysics but lapses back into emotional involvement; since he is a man and a sage, he cannot live for long on any level other than the metaphysical.[14]

The myth attempts within the frame of the story what the text attempts in the culture: to teach the philosophical doctrine of illusion to nonphilosophical worldly Hindus who dwell in the common sense world of materialism and science, the world in which reality is defined by normal, social, conventional human existence ("This is my husband," "This is my son"). Within the myth of Yashodha, this lesson is a failure: she does not change her view of what reality is. Outside the myth, however, the situation is the reverse: the reader (or hearer) does change his view; he is moved to redefine his concept of reality. The persuasive power of the vision in the myth is not logical but irrational and emotional; it dismantles our rational disbelief even while it fails to overcome Yashodha's combination of rationality (in clinging to the phenomenal world) and irrationality (in backsliding from her moment of pellucid enlightenment into the comfortable, familiar maternal love of the god). The myth of Markandeya, on the other hand, works in the opposite way: Markandeya *does* change his view of what reality is, and he does this by being shocked into a state of metaphysical rationality and a philosophically grounded love of the god. Doubtless, many readers of the text would follow him on this path, and others would not.

Both Yashodha and Markandeya mediate between two points of view, that of the omniscient narrator or enlightened sage (who knows that reality is on the other side of the mouth of God) and that of the blinkered participant in the drama (the other villagers or inhabitants of Vishnu's stomach, who think that reality is on this side of the mouth of God). For us, as readers of the myth, several options are presented: one could play the role of Yashodha or the role of Markandeya, for each of us must find the level on which he prefers to live—or, rather, the level on which he was meant to live. In any case, the myth jars us out of simply accepting the level on which we happened to be before we encountered the myth.

The androcentrism inherent in the Hindu pattern of saved males and doomed females[15] is somewhat mitigated—and perhaps explained—by the thinly veiled female gender of the divinity who swallows the protagonist. For, inside the mouth of God is not merely his belly, but his womb. The demonic sage Shukra is swallowed by the god Shiva and then emitted through Shiva's phallus in the form of seed; the divine sage Kaca is in turn swallowed by Shukra and emitted through his side.[16] Each of these sages emerges with the secret of immortality and is, in addition, made immortal by becoming the child of the god who gives birth to him; in this he enacts the "true" perception of reality appropriate to the enlightened male sage (Markandeya, Jesus), in contrast with the deluded woman's view of god as her child (Yashodha, Mary). The symbolic femaleness of the swallowing god becomes literal in a final variant in this series, in which Shukra is seized by a female demon who has teeth and eyes in her vagina; she swallows him not with her upper mouth but with her lower, the *vagina dentata.*[17]

Shukra is merely one Indian example of the hero who journeys through the gates of hell or through the jaws of the dragon who guards the gates of hell. Odysseus survives a number of encounters with such devouring females with their "hollow caves" and toothy mouths; Scylla is the most blatant of these, with her hollow cave in the middle of her body, lined with teeth full of black death,[18] but she is followed hotly by Charybdis, Circe, Calypso, the Sirens, and Clytaemnestra. In Euripides' *Bacchae* the worshipers of Dionysus devour him ritually by devouring the animals in whom he dwells (primarily cattle); Pentheus, who rejects the god by steadfastly refusing to acknowledge the way in which the myth has taken over his reality, is dismembered by the god's human instruments, the mediating women, the Bacchae. Dionysus (who is androgynous in his birth as well as in his form) proves his existence to the skeptical Pentheus by using him as the sacrificial victim in place of the god himself or of the usual surrogates. The god draws Pentheus helplessly and hypnotically into the whirlpool of the myth that he denies, by transposing the myth from the ancient past *(in illo tempore)*, where Pentheus thinks it belongs, into the present moment, collapsing profane and mythic time together,[19] as ritual so often does. That Pentheus is forced to behave like a child and is then killed by his own mother has further significance in the context of the myths of Shukra and Kaca (who are devoured by gods who then give birth to them from male wombs).

On the psychological level, one could gloss this corpus of myths as expressions of a deep and widespread fear of being devoured by the mother (a projection of oral aggression) or by the whore (the myth of *vagina dentata*).[20] Indeed, the universality of the experience of being fed milk at the breast (and the subsequent correlative experience of feeding semen to the vagina) may well explain why this particular corporeal image is so often unconsciously chosen to express so abstract a concept as the transition from the physical to the metaphysical world. To this extent, the Freudian hypothesis does help us to understand the processes of creative thought.

But the truth or falsehood of the Freudian gloss in no way diminishes the role of the myth in jarring us into a reassessment of the nature of the reality of the world. For the myth sets out explicitly to dramatize the fact that the boundary between myth and reality is highly mobile: though it may appear to be firm and permanent, it is ultimately arbitrary and elusive.

3. *Levels of Reality in Dreams and the Theatre: The Last Visible Dog*

Within the myths characters often believe (mistakenly) they are dreaming, while other, wiser observers suggest that, on the contrary, people who think they are dreaming often perceive (rightly) that they are participating in a myth—that is, that they have actually crossed over to the other side of the mouth of God. And mythologists suggest both that dreams incorporate into personal fantasy elements of traditional, shared mythology, and that mythology is built up out of shared elements pooled from individual dreams. This is not the occasion to review the extensive literature on myths and dreams, nor to assess the oft-challenged hypothesis that the universality of the vocabulary of dreams may be the basis of the universality of the vocabulary of myths.[21] Eliade puts the case well: "The unconscious displays the structure of a private mythology. . . . It can even be said that modern man's only real contact with cosmic sacrality is effected by the unconscious, whether in his dreams and his imaginative life or in the creations that arise out of the unconscious (poetry, games, spectacles, etc.)."[22] Stories about dreams, like stories about myths, often deliberately obfuscate the understructure of common sense in such a way as to leave the reader uncertain which is the "real" level, like the victim of a practical joke who wakes up after a drunken night to find himself in a room in which the rugs and chairs have been affixed to the ceiling and the chandelier appears to grow out of the ground. A famous example of such obfuscation is the story of the Chinese philosopher Chuang Tsu:

> Once upon a time Chuang Tsu dreamed that he was a butterfly, a butterfly fluttering about enjoying itself. It did not know that it was Chuang Tsu. Suddenly he awoke with a start and he was Chuang Tsu again. But he did not know whether he was Chuang Tsu who had dreamed that he was a butterfly, or whether he was a butterfly dreaming he was Chuang Tsu.[23]

Stories of this sort, perhaps imported from India or China, were known and loved in classical antiquity.[24]

A delightful modern variant of the Chinese myth of the dream is the work of Woody Allen:

> The Emperor Ho Sin had a dream in which he beheld a palace greater than his for half the rent. Stepping through the portals of the edifice, Ho Sin suddenly found that his body became young again, although his head remained somewhere between sixty-five and seventy.[25] Opening a door, he found another door, which led to another; soon he realized he had entered a hundred doors and was now out in the backyard. . . . When the Emperor awoke he was in a cold sweat and couldn't recall if he dreamed the dream or was now in a dream being dreamt by his bail bondsman.[26]

Despite the characteristically Allenesque incongruities, the myth emerges as a myth through its classical mixture of the magical and the banal, the dream/reality reversal, and the doors beyond doors.

A famous literary example of the dream turned inside out is the episode of the Red King in *Through the Looking Glass*, in which Alice tries to prove that she is real by pointing out that she is crying, an appeal to the emotional truth of myth but one that is wasted on Tweedledum, who simply remarks, in a tone of great contempt, "I hope you don't suppose those are *real* tears?" At the end of the book it appears that Alice has dreamed that the Red King dreamed that Alice saw him dreaming of her, but Lewis Carroll will not let us solve the riddle so easily: "Let's consider who it was that dreamed it all. This is a serious question. . . . He was part of my dream, of course—but then I was part of his dream, too! . . . Which do *you* think it was?"[27]

One device that Carroll uses to blur the boundaries is a variant of the traditional technique of the Chinese box narrative, the tale within the tale within the tale, or the doors within doors. The twist comes when Carroll reverses the position of two of the narrators in the chain (Alice and the Red King), further challenging the reader's assumption that he is on the very outside of the box—the last one in the line of listeners—rather than part of the story being told to yet someone else.

Myths often imply that there is no end to the boxes, sketching an infinitely receding image that may be represented visually, as on the Dutch Cleanser can: a woman holding a Dutch Cleanser can with a picture of a woman holding a

Dutch Cleanser can with a picture of a woman . . . Velasquez's painting that makes use of this device (a man with a mirror) is ingeniously hung in the Prado on a wall facing a mirror, so that the observer can trace the images inside the painting and then outside it again, with himself as the pivotal level of "reality." The metaphysical implications of this *mise en abîme* make use of that peculiar juxtaposition of the banal and sublime (the "incongruity" of myth[28]) that serves Woody Allen's humor (as it served Benchley and Perelman before him, and the narrators of comic myths centuries before them), but also serves a far more serious purpose. In Russell Hoban's book for children, the "last visible dog" on a can of dogfood, illustrated like the Dutch Cleanser can, becomes a symbol for heaven, for the place where the protagonists find a release from the hell of their reality.[29]

The locus classicus for this onion-layer technique of storytelling is the play within the play, which often carries with it the implication that the audience witnessing the play, within which there is a play, is itself part of a play—perhaps part of a play within another (metaphysical) play. Of all literary forms, drama best reproduces the effects of myth, most powerfully through the catharsis of the tragic drama, but also in the surreal humor of great comedy such as Aristophanes' *The Frogs*.[30] In our day, drama (or film) often takes the place of the communal ritual that was a frequent (though certainly not inevitable) complement to the traditional myth.[31] Drama built upon archetypes functions as the enactment of a myth.

Shakespeare is the supreme master of the play within the play, not merely in his explicit use of the device, as in *Hamlet* and *A Midsummer Night's Dream*, but in the depiction of historical characters conscious of their roles as actors. Richard II acts out a play that he constantly rewrites and plays as an alternative, personal reality competing with the reality based on historical facts[32] (a reality that is, in its turn, merely another myth,[33] somewhat closer to the common sense end of the continuum between reality and fantasy, but hardly the photographic representation of "*Wie es eigentlich gewesen ist*" that the nineteeth century historians thought they had snapped). But Richard II is not merely acting out a play; he is playing a myth—or, rather, playing two myths. Richard is making his own life into a myth by selecting classical fragments that correspond to the actual events of his life and constructing a dramatic truth out of them. Yet he also perceives, in a less specific way, an entire myth to which his inner tragedy corresponds. By comparing himself to Christ betrayed by Judas, "Richard is finding his supporting script. He is finding the fragments of the myth, the outline to carry his purified emotion through the scene he is about to act—and create. He is Christ again in the holiness which is violated—but he is particularly Christ in the infidelity around him."[34] Richard does not merely *make* the myth he lives; he also *finds* it.

4. *The Chain Reaction between Reality and Myth*

Hindu literature is self-conscious about the role of the audience in the play within the play. The use of aesthetic experience in salvation was the subject of much discussion; by seeing, and therefore participating in, the enactment of the myth of Krishna, one was led unconsciously into the proper stance of the devotee. Moreover, the viewer was not merely inspired to decide what role in the cosmic drama he wished to play (mother, lover, brother, or friend of Krishna); like Richard II, he was inspired to discover what role he *was* playing, had been playing all along, without knowing it.[35]

This assumption is implicit in the argument in Aristophanes' *The Frogs*, a play within a play whose protagonists are playwrights. In answer to Aeschylus's accusation that Euripides had put "unholy matings" on the stage—in particular by depicting the incestuous passion of Phaedra with Hippolytus, Bellerophon with Stheneboia, and anonymous women who go to bed with their brothers—and that Euripides had called Oedipus a happy man,[36] Euripides replies that his depictions were harmless. To this Aeschylus objects, saying that married women took hemlock out of shame because of Euripides' depiction of the love of Stheneboia for her stepson Bellerophon. Here Aeschylus blurs the permeable fourth wall between theatre and reality: the audience becomes part of the drama by reacting to it. Euripides is being judged not only for the actions of "his" Bellerophon and Stheneboia, but for the actions of the "real" women who took hemlock as a result of seeing the play.

Euripides counters this with a claim that mythic drama and reality do in fact intersect, but on a different plane, and one that justifies rather than condemns his depiction of the myth: "The story I told about Phaedra was true, wasn't it?" he argues, and Aeschylus does not deny this.[37] But Aeschylus's final rebuttal takes yet another tack: he says that even true stories, when immoral, should not be put on the stage, since poets speak to young men (in the world of the theatre) as the schoolmaster speaks to children (in the world of reality). Thus Aeschylus accepts the assertion that real events do lead to myths about real events (that the story of Phaedra was true), but turns around and asserts that the myths, in their turn, produce real events (forming the character of young men as the schoolmaster instructs children), for better or for worse.

This very Greek line of reasoning is also found in Plato, who says that the tyrant enacts what haunts us in dreams when *logos* fails us; these thoughts, suppressed even in sleep, are present in everyone (an early argument for the universality of the dream/myth): someone will lie with his mother or with a god or an animal, or commit murder or eat forbidden things (a possible reference to cannibalism), and so on. Eros is the tyrant in all of us, but, Plato warns, we must not tell stories like that about the gods to children even if they are *true*.[38] Like Aristophanes, Plato affirms the power of myths to grow out of reality and to *make* reality, in turn. The individual could, like Richard II, both find his myth and make his myth, and Plato fears that people will find a bad myth, and use it to construct an evil reality.

For a vivid Greek example of the unconsious play within the play used as a device to prove the reality of myth, one need look no farther than Sophocles' *Oedipus Rex*, where, with grotesque irony, Sophocles has Iocasta assure Oedipus that he need not worry about the prediction that he would sleep with his mother, since everyone knows that that is something that men always dream about (as Plato pointed out) but never do.[39] Penelope advances a similar argument when Odysseus, in disguise, tells her that her dream of an eagle killing the geese in the house means that her husband (Odysseus) will return to kill the suitors. She says that dreams that pass through the gates of horn come true, but those that pass through the gates of ivory do not, and she thinks that her dream was not from the gates of horn.[40] She is, of course, as wrong as Iocasta was. That Oedipus is fooled into mistaking a true myth (that is, a myth that is his reality, a dream from the gates of horn) for a "mere dream" (from the gates of ivory) is an illusion (like those that Markandeya and Yashodha *thought* they were experiencing). This illusion is raised to yet another level by the next frame of the myth: for we, the audience, know the reality not only of Oedipus's incest but of our own, an insight clear as day to the Greeks 2,500 years before Sigmund Freud made it a canon.

The assumption that the myth in the theatre expresses a human truth shared by the audience is implicit in Aeschylus's accusation of Euripides: the effect of the myth of Stheneboia and Bellerophon was not to establish a social law ("Don't commit incest.") or to reinforce an already existing social law ("Aren't you glad you don't commit incest!"), nor to inspire antisocial behavior ("How about committing incest?" arguing on the lines that violence on television causes children to grow up violent), but to reveal an already existing reality, one that was masked and unconsciously denied. It made women commit suicide out of shame at the sudden realization of their own incestuous impluses, by showing them that they were already participating in the myth of Stheneboia by virtue of their erotic relationships with their sons.[41] This is reinforced by Aristophanes' equation of the audience with the sinners in hell, a motley group who include sexual miscreants.[42]

The myth/drama in *Hamlet* has the same effect on Claudius that the myth of Stheneboia had on the Greek wives: it makes him face not only the fact that his guilt is known but even the fact that he is guilty; the play within the play precipitates him directly into the episode of (unsuccessful) repentant prayer. For, to the extent that (as Shaw pointed out) conscience is the fear of being caught, the public experience of mythic truth through the drama is the instrument of conscience—not of social conscience, but of cumulative individual conscience.

5. *Myth as the Inverse of Social Charter*

Myths of the mouth of God are the opposite of social charters. The social charter theory has an impeccable Durkheimian pedigree and remains canonical for most anthropologists today, as well as for Eliade, who cites Malinowski's straightforward definition: "These stories . . . are to the natives a statement of a primeval, greater, and more relevant reality, by which the present life, fates, and activities of mankind are determined, the knowledge of which supplies man with the motive for ritual and moral actions, as well as with indications as to how to perform them."[43] This description, of course, applies to many myths; indeed, it is even applicable to certain aspects of the myths of the mouth of God, for often the one who is swallowed is not a dégagé sage but a very much engagé hero, who emerges from the liminal jaws to give birth to a culture and to establish its ritual forms[44] (including, of course, the ritual of initiation for which the myth provides the archetypal model). Athena, swallowed by Zeus and then reborn to teach the Greeks their crafts, is an example of such a combination of motifs.[45] The myth as social charter is also manifest in the "moral primer" function of the myth of history.[46]

But many myths ultimately depart from the limitations of the social charter. They do indeed reveal a "more relevant reality" that inspires certain action; they inspire "archaic man," in Eliade's formulation, to reenact certain rituals; they inspire the witness of the mythic drama to reassess his view of reality or even to act in a different way; and they are "social" in the sense that they may be shared or cumulative experiences of moral conscience as well as common bodies of traditional knowledge. But they are not social charters.

Aristophanes and Plato disapproved of myths precisely because they did *not* teach people the right way to behave; on the contrary, the myths showed how inevitable "bad" behavior was, an insight that is at the heart of the tragic drama. The element of cumulative individual conscience might indeed inspire action, and to that extent it might be regarded as prescriptive, but it inspired *bad* actions: Greek women to drink hemlock, and Claudius to have Hamlet shanghaied. Lévi-Strauss has pointed out that myth imagines certain impossible situations in order to show that they *are* impossible, to allow us to go on living with an insoluble paradox.[47] Repressed Hindus rejoice in myths of extreme forms of ascetic yogic mortification and erotic Tantric orgiasticism; these mythologies provide fantasies that establish the boundaries of the real Hindu world, making it possible to totter on the brink without actually falling into it, and then to come back to the realm of the possible, now a world whose bounds have been extended, if only by a little.[48] The myth supplies an ideal no less useful for being unreal. It is a target (positive or negative) that establishes the full range of the scale, like the paradox of Achilles and the tortoise: you never reach the shore, but you measure all your leaps in terms of the distance by which you reduce the gap between you and the shore. The mythic drama serves vicariously not only as an escape valve to release intolerable tensions, but also to allow its witness to experience at one remove what it is actually like to translate fantasy into reality; the drama is more real than fantasy, less real (and hence less costly[49]) than reality.

Myth in this limited function as social touchstone exercises a complex interrelationship with society that could be described as cybernetic, symbiotic, synergistic, or simply chicken-and-egg. Myths told to children influence how they grow up; children grow up with certain cultural preoccupations that lead them to tell certain kinds of myths to their children. Thus, anthropologists and psychologists speak of shared "nuclear fantasies" transmitted in India from mother to child and later modified by individual experience; the myth of the decapitating goddess is based on the child's overabrupt weaning. In this view, the actual experience precedes and determines the myth. But it is also suggested that the shared fantasy of the demonic goddess inhibits the sexual activity of young married men in India. In this view, the myth is not a reflection of behavior but a cause of it.[50] Clearly, there is some truth, and some falsehood, in both views. To the extent that myth arises out of reality and has an effect on reality, there can be no particular starting point or end point: it is a cycle.[51]

Myth has been defined as "a cosmic map of an unknown country, where each piece of the landscape is recognized as totally familiar when you get there, only it does not tell you how to get there, or how to act when you do."[52] In this, myths are quite different from paradigms; the myth of Christ's Passion did not tell Richard II what to do, only how to understand what he was doing anyway. This is why, as Lévi-Strauss points out, myth is never an answer to the problems it allows us to state;[53] it merely lets us recognize those problems as mythic.

For the myth does not tell us what to do; it makes us realize that it is not as simple as we thought it was (or as our lawmakers told us it was) to figure out what to do. Yet, myth tells us that we must do *something*. Rilke's description of the effect of viewing a statue of Apollo speaks of this: "*Du muss dein Leben ändern.*"[54] The myth achieves this effect not through logic or example (positive or negative) but by activating our emotions as it punctures our assumptive world. In our everyday life we cling to our private cosmologies long after they have outlived their power to sustain us, patching them up as scientists patch their theories with epicycles, as a child patches a disintegrating Teddy bear; we make minor or major alterations in the superstructure of our lives—a bigger house, a different job, a younger wife—until the whole jerry-built construction topples down under its own weight. In the end, we are forced to realize that the world remains the same, despite our manipulations; but the myth offers a transforming change of perspective.

6. *Truth Criteria for Myths*

The positive or negative moral effect of myth on its audience led to a reassessment of the truth or "reality" of myth in the Western world. We have seen the way in which the myths of the mouth of God attempt to undermine one's confidence in the reality of apparently real phenomena (on this side of the mouth of God). The obverse of this process is the attempt to establish the reality of apparently mythic phenomena (on the other side of the mouth of God).

At first, Aristophanes and Plato argued that, although myths might be true (though Plato also implied that they might *not* be), they were immoral (and therefore were not to serve as social charters). Later it was argued that, because the myths (or the gods who were the subject of myth) were immoral, they could not be true (or real):

> The target of the rationalists' attacks was primarily the adventures and arbitrary decisions of the Gods, their capricious and unjust behavior, their "immorality.". . . This thesis—more particularly the objection that the divine myths as presented by the poets cannot be true—triumphed, at first among the Greek intellectual elites and finally, after the victory of Christianity, everywhere in the Greco-Roman world.[55]

Xenophanes argued that the stories told by Homer and Hesiod about the gods could not be true, because in these works "the gods do all manner of things which men would consider disgraceful: adultery, stealing, deceiving each other."[56] In other words, the gods could not be both immoral and immortal.[57] Although it is in fact possible to believe in the myths without believing in the gods, or the reverse, Plato and Xenophanes condemned them both.

That the good and the true are one and the same is part of our heavy legacy from Plato; in India, too, the ideas merge so completely that one Sanskrit word (*sat*, related to our own "is") means not only what is true, and what is good, but what is *real*. The myths, by depicting the shameful things that Aeschylus objected to (though he, at least, did not deny that they were *true*), came to be defined as quintessentially unreal: "If in every European language the word 'myth' denotes a 'fiction,' it is because the Greeks proclaimed it to be such twenty-five centuries ago."[58]

Most "civilized" people assume that myths are not true. But this assumption is not shared by traditional or archaic cultures: "In societies where myth is still alive the natives carefully distinguish myths—'true' stories—from fables or tales, which they call 'false stories.' "[59] And in the course of defending themselves against the rationalists, mythmaking cultures have often attempted to beat the realists at their own game, to *prove* the reality of myths in "scientific" terms.

There are many Indian and Tibetan tales in which a man steps somehow over the threshold into the world of myth and lives there for many years before returning to his own world, where he reappears only a split second after his departure (in the time scale of the people of that world); he then produces some sort of physical proof that he has been in another world, proof that is accepted by his amazed family and friends.[60] Japanese myths present a dislocation of time in the opposite direction: the hero returns after his mythic journey to find that everyone in his village has aged terribly; the proof of his experience is the proof of his own identity (when he reveals knowledge or characteristics that no one but he would have, and that are accepted as "historically true" by the surviving villagers) and the fact that he has not aged (as he would have done had he stayed in this world). That the hero wins the secret of immortality and the secret of his own identity is usually regarded as the metaphysical point of the mythic journey; here, it is the physical point, the evidence of the reality of the myth.

In one Hindu story of this type, a king disappears from his court and materializes in a village of Outcastes; he lives there for many years, marrying and begetting children, until, during a famine, he commits suicide by entering a fire (being swallowed by the jaws of hell), disappearing from the village and reappearing at court, which he has, apparently, never left during the brief time that the courtiers think has elapsed. The king eventually verifies his story by producing the wife, children, and friends that he had in the Outcaste village. The text uses this story to prove that, since all is illusory, one person's private illusion is just as real as any other part of reality: "The illusion in the king's mind having reflected itself on the minds of the outcastes as though it were a reality . . . becomes objectivized in the physical world."[61]

This view that, since all that is real is the mind, everything that exists is merely a mental projection, may perhaps be regarded as extreme when applied to physical reality, but it is certainly true of myth. Lévi-Strauss maintains that mythology is simply the mind talking about the mind, rather than the mind talking about "reality," and he regards the task of the mythologist as the search for the "constraining structures of the mind," an enterprise that he regards as "Kantism without a transcendental subject." That is, since the mythology of atheism is not looking for a truth basis "out there," it finds it "in here." This makes the mythical pattern an "autonomous object," and Lévi-Strauss describes it in terms not unlike those of the Hindu text: "I believe that mythology, more than anything else, makes it possible to illustrate such objectified thought and to provide empirical proof of its reality."[62]

Now, the transformations in time and space described in the Hindu text are strikingly similar to certain features of the hologram,[63] which exists outside of time and space and thus can reverse time, like the quark that appears to move from here to there but arrives there before it has left here. The image in the king's mind is broken down and rebuilt in another place (the "inverse Fourier transformation"); the king's memory becomes a hologram. Such dislocations of time and space are also the basis of the myths of the mouth of God. Mystic and mythic texts redefine time just as Einstein did; certain myths and certain scientific theories use the same metaphor to explain the way in which the brain uses images to map space and time.

7. *The Common Sense of Magic*

Attempts to establish the reality of myth through "scientific" common sense evidence are legion in world mythology. When Homer tells us that Athene spoke to Telemachus in a dream, or by taking the form of Mentor, one might think he was allowing his audience the option (which the post-Homeric rationalist Greeks so often took) of interpreting this allegorically or psychologically: Telemachus was inspired (on his own). But Homer does not leave it there; he insists on meeting the realists on their home territory. We are told that Athene in the form of Mentor accompanied Telemachus on his voyage to Nestor and conversed with Nestor; later, Noemon tells the suitors about a disquieting rip in the fabric of reality: "I noted Mentor going on board Telemachus's ship as leader—or else it was a god who resembled Mentor in all ways. But this is what I wonder at: I saw noble Mentor here, yesterday morning, but at that other time he went aboard the ship for Pylus."[64] The suitors' reaction to this cognitive dissonance[65] is to ignore it; they think (wrongly, as we know and they later find out to their peril) that it has no reality for their story, and we may assume that they shrugged it off with some rationalization such as, "Perhaps Noemon did not see properly," or "Perhaps Mentor did not remain on board after all." So, too, when Odysseus returns and Athene speaks to him, he recognizes her as Athene (though he addresses her as Mentor), but the suitors think she is Mentor; they rebuke her and then say, "Mentor has gone away," even when she turns into a swallow and flies up to the roof.[66] Like Yashodha and Pentheus, they reject the theophany.

But the man who does "wonder" at it is the most matter-of-fact of men, Noemon. Noemon doesn't care about Athene; he just wants Telemachus to come back with the ship he borrowed from Noemon, who wants to sail it to Elis to see his twelve brood mares and to break in a mule; Noemon worries that some sort of divine monkey business is going on with *his ship*. This plain man mediates between the evil suitors who do not believe (or, worse, do not care) that Athene was on the ship, and the good people who do believe—Homer, his audience, and (within the story) Telemachus and Nestor. The latter two first "wonder" like Noemon, and then immediately realize that the pseudo-Mentor is a goddess.[67] Nestor at once makes elaborate plans to inlay the horns of a heifer with gold and sacrifice it, evidence that he does not normally hobnob with the gods but is able immediately to assimilate this extraordinary event within the range of his ideas about what is possible. The reasonableness of mythic experience is made convincing through the use of the banal detail of Noemon's mule or the mud in Krishna's mouth.

When Athene makes her penultimate appearance in the ambiguous form of Mentor/swallow, the bard Medon reports, "I myself saw an immortal god who stood close beside Odysseus and resembled Mentor in all ways. But then he appeared before Odysseus as an immortal god. . . ."[68] Medon uses the same phrase that Noemon had used to describe Athene/Mentor, but he recognizes that she is a goddess. For, as a poet—the narrator of the tale within the tale—he alone has one foot in the world of myth and the other in the world of reality. Indeed, Medon's argument has a crucial effect on the actual events of the *Odyssey:* though the suitors are apparently impervious to theophany, their friends and relations (to whom Medon speaks in this passage) are persuaded that there is, in fact, a goddess standing beside Odysseus, and they turn back without exacting the revenge on which they had been intent before the intervention of Medon. Thus the poet's testimony to the *deus ex machina* has the effect of an actual *deus ex machina;* the myth, when believed, changes reality.

One common sense test to see whether or not you are living a myth is laid out explicitly in several Sanskrit texts. If you are in doubt as to whether your companion is a mortal or a god, look for these telltale signs: gods do not blink or sweat; their garlands never wither, nor does dust settle on them; and their feet rest ever so slightly above the ground, like a "hovercraft."[69] Significantly, the myths in which these rules appear present them as a means by which one can *avoid* close encounters with gods, avoid the theophany and the dangerous transition to the other side of the barrier[70] (the intercourse with the gods that Plato listed as tantamount to incest or bestiality). The fear of theophany, the desire *not* to be drawn across the border from reality into myth, is manifest in the figure who resists the myth: Oedipus, Pentheus, Yashodha, the suitors in the *Odyssey,* as well as in Clark Gable's distrust of the flimsy barrier in *It Happened One Night.*[71]

Sometimes the very vehemence with which the myth is denied on one level is testimony to its insidious power on another. As archy the cockroach remarks, "you want to know / whether i believe in ghosts / of course i do not believe in them / if you had known / as many of them as i have / you would not / believe in them either."[72] But generally, in our skeptical times, the theophany is simply not believed. Although from time to time hard proofs are still sought, they are never culturally validated. Almost always the witness is a child, who is of course not believed by adults. A notable exception to this pattern is the film *Miracle on 34th Street,* in which the existence of Santa Claus (who is literally on trial) is finally established not by any sacred authority, but by the epitome of temporal, banal authority: the U.S. Postal Service. Usually, however, the physical proof of the reality of the myth either vanishes or is judged too ambiguous to be persuasive. Thus, when Dorothy returns from the Land of Oz (in the film *The Wizard of Oz*), she discovers that the magic red shoes that would have proved her adventure to be true (and not merely a dream, as it appeared to her Kansas friends) have fallen off on the way back across the barrier. When the

Banks children return from a magic tea party with Mary Poppins (a classic combination of the mythic and the banal), *they* know that the crumbs on the rim of Mary's hat can only be explained by the fact that she had tea while suspended upside down by magic, but they know better than to try to explain that to their parents.[73] For, as the starling in the book explains, Mary Poppins is the only grown-up who retains knowledge of the mythic world, a knowledge that all infants have but that disappears when the child learns to speak.[74]

8. *The Problem of the Pregnant Male*

Hindu myths often play cat-and-mouse with the demand made by myth for the suspension of common sense criteria of reality; common sense wanders in and out of the myth like a bit player. Stories about pregnant males are often liminal in this way, straddling the threshold between the worlds of reality and myth. We have already alluded to the myths of Shukra, who is swallowed and given rebirth by the god Shiva, and Kaca, who is swallowed and given rebirth by Shukra. These stories of the mouth of God are often told without challenge. But some texts pollute the myths with common sense:

> The wife of a certain demigod was too great with child to attend a party she wanted to go to. She asked her husband to take the embryo so that she could attend, and out of affection and kindness he did so, for he had the magic power to assume any shape. With her beautiful figure restored, she went to the party, where, enjoying the pleasures of the flesh with another young demigod who took her fancy, and recalling the pains of childbirth, she decided not to return. Her husband suffered for the full nine months as the embryo grew, and finally, unable to find a passage for the delivery, he died in agony.[75]

The myth leads the reader down the garden path, luring him into a suspension of disbelief, and then suddenly bringing him up short with a reminder that of course a man can't *really* give birth to a child. Other male pregnancies have less tragic but equally hard-nosed consequences: one king became pregnant and gave birth without any labor pains, and the latter fact, but not the former, was regarded as "a great miracle"; he had trouble, however, in breast-feeding the child, and so he invoked a male god to produce milk from his (the god's) thumb.[76] Again, the latter was regarded as reasonably likely to happen, while no one apparently expected the king to be able to lactate.[77] The distinction is not simply a matter of the different powers of mortals and gods, for other Hindu gods do not mind becoming pregnant, but draw the line when they begin to lactate and therefore, only then, become a laughingstock in heaven.[78] One ricochets back and forth between physical and metaphysical standards of what is possible.

Where the Hindu myths degenerate into common sense, the North American Trickster cycle moves in the opposite direction, from common sense to myth. The Trickster, who is always hungry, wishes to marry a chief's son in order to eat the wedding banquet. He makes a vulva out of an elk's liver, and breasts out of an elk's kidneys, and he tricks the chief into accepting him as a woman and marrying him to his son. So far, we are still in the world of common sense, of bawdy humor and events that are physically possible.[79] We are therefore taken off balance when the text goes on to tell us that the Trickster became pregnant and gave birth to three boys.[80]

These traditional stories fight against great odds to maintain the underlying belief in the pregnant male, because it expresses an essential and useful truth. The Freudians reveal its truth basis in male pregnancy envy and in sublimation through anal creation;[81] the androcentric mythmakers use it as an effective metaphor for the socially convenient idea that men can do anything that women can do. The mythic truth of the pregnant male extends into the broader corpus of myths in which the hero achieves rebirth by being swallowed and released by a male god who plays the role of a goddess, a primeval androgyne.[82] But the stories that challenge these myths are part of an uneasy world in which the line between myth and reality is still rigidly defined, so that the attempt to bridge the gap must come about not by blurring the line, nor by undermining reality, but by trying to drag the myth to the other side, to the side of reason and science.

9. *The Science of Myth: The Constraint of Elegance*

This rapprochement between myth and science has recently received a boost from an unexpected ally: the natural sciences themselves. It is increasingly apparent that both science and myth are essentially committed to the belief that there is order in the universe. The religious basis of this belief emerges from such statements as Einstein's much-quoted remark that God does not play dice with the universe (though in Hindu mythology he not only plays dice, but cheats as well[83]) and in J. Robert Oppenheimer's invocation of the doomsday epiphany of the *Bhagavad Gita*—the jaws of the God[84]—when he witnessed the detonation of the first atomic bomb. Our underlying biological directive to see patterns, to jump to conclusions, has high survival value if in fact the world is ordered.[85] These patterns are the archetypal elements of myth, and the evolutionary advantage of jumping to conclusions substantiates the pragmatic validity of believing in what cannot be logically or rationally proved.

This thirst for order fuels the prime criteria for both a scientific theory and a myth: elegance and repetition. An established theory is abandoned (or regarded as inadequate) not merely upon the discovery of new facts (for cherished theories generate epicycles and corollaries almost beyond endurance in order to accommodate contradictory data; this is the function of cognitive dissonance), but upon the creation of a more elegant theory.[86] The aesthetic value of elegance also affects the artist's manipulation of myth, [87] but scientists jettison a theory only when cumulated data are accommodated by a new theory that is both more elegant and logically more persuasive. Myths persuade us with their emotional beauty, not only to restructure our assumptions about the real world (as scientific theories do), but even to abandon our assumption that the world is real at all.

There are, nevertheless, significant differences between the processes of scientific and mythic conversion. "Elegance" in scientific terms generally refers to simplicity, to Occam's razor: one wishes to account for as many facts as possible with as few theorems as possible. Elegance in myth, by contrast, is extravagant: the high value placed on repetition of the theme and variations tends to produce a myth that accounts for as little data as possible with as many theorems as possible. Laplace boasted that he did not "need" the hypothesis of God; it is unfashionable to believe in things that science no longer finds necessary to mention in its theories.[88] But need is irrelevant to the economics of mythmakers, who are on the side of King Lear: "Allow not nature more than nature needs, Man's life is cheap as beast's."[89] Science's laboratories are Bauhaus; the palace of myth is baroque and rococo. Indeed, Occam's razor is merely one of a number of constraints of logic or reality that science must apply to the "melange of the various actual or created elements of our memory,"[90] while fantasy must not.

But the arbitrary nature of these scientific constraints serves once again to join myth and science in a common enterprise. Common sense, as Einstein once remarked, is what we are taught by the age of six (while certain Jesuits allowed one more year for a similar indoctrination); that is, common sense is an attribute of culture, not of nature, a part of myth rather than a part of reality. As scientists become more adventurous in restructuring their reality (and most revolutionary discoveries are made by young scientists, as close as possible to the six-year-old's Eden not yet invaded by the serpent of common sense), common sense is thrust unceremoniously into a dusty old attic along with the astrolabes and the perpetual motion machines. We learn from the special and general theories of relativity and quantum and nuclear mechanics that

> the laws that relate to us the nature of the macrouniverse . . . and those that relate the nature of the microuniverse . . . provide a somewhat similar conception of reality. This reality, highly mathematical in nature, departs considerably from ordinary sensory experience.[91]

One must beware, however, of implying that both science and myth prove that the universe obeys certain disquieting laws of time and space, that science and myth substantiate each other's more outlandish claims, like two drunks holding each other up. The point is, rather, that their ways of looking at the universe are more similar than has previously been supposed, though in fact it ought not to surprise us, since both scientists and mythmakers are human beings using the same mental equipment to map the same universe.

The value of myth for science lies in providing a change of metaphor that creates a fresh focus, a new set of terms for dealing with intellectual material, and thus serving both to explode mental logjams and to provide a source of creativity in the search for answers. Solutions to scientific problems often require metaphors that may not yet be conceptualized;[92] the lack of such metaphors is another sort of "constraint" that works upon science but not upon myth, to the detriment of science and the advantage of myth. Mythmakers, like the White Queen, have had more practice than scientists in believing impossible things ("half an hour a day").[93]

Finally, it is worth noting that the two systems, when they do conflict, are not necessarily incompatible; here, too, cognitive dissonance comes into play. The "maps" are not mutually exclusive. New Yorkers who recognize the truth in Saul Steinberg's brilliant map of the planet as seen from 9th Avenue (with Jersey a mere brown blob, and China and Russia as vague streaks on the horizon beyond the isolated points that are Los Angeles and Chicago) are also perfectly capable of finding their way around with the aid of conventional street maps. We choose our maps according to what universe we wish to move in at any given time.

10. The Recognition of Myth in Life

At certain crucial moments, we seem to follow two maps at once, as if two celluloid overlays were placed upon the same page; here again myth and reality intersect. There are times when we confront an actual experience and respond to it as we would respond to the confrontation of a myth. We recognize the myth in moments of real life because we recognize certain archetypal elements common to myth and life; and, as the banality of myth demonstrates, this happens to everyone, even to the "plain man" like Noemon. Jung remarked that "myth is not fiction: it consists of facts that are continually repeated and can be observed over and over again. It is something that happens to man, and men have mythical fates just as much as the Greek heroes do."[94] Richard II recognized two myths at once: the shared, tragic myth of Christ, which he found, and the myth of his own particular character, which he constructed out of smaller mythic moments. These moments include, but are not limited to, those formalized in rites of passage: the experience of birth (ours or our childrens'), suddenly changing from child to adult, falling in love, marriage, death (ours and our parents'). The same feeling overcomes us in moments of more modern and banal tragedy—news of failure or desertion, an accident, a mugging, being sentenced to prison. We encounter these primal echoes also in classical occasions of joy—plunging into the ocean, galloping on a young horse, climbing mountains, watching geese fly south, lying out under the stars, listening to sublime music, watching the sunrise or sunset.

These passionate encounters with life are so classical that they often border on the trite, like something out of a cheap novel or a Hollywood-sent dream; they may embarrass us to the point where we hesitate to acknowledge their genuine power over us. Their juxtaposition with the everyday quality of the rest of our lives makes them seem overblown, even as this banality forges the essential bond with the reality of the myth. But these experiences momentarily lift the artificial barrier that we have imposed between myth and reality, so that we gaze back suddenly upon the myth that we had unknowingly entered. All at once, in retrospect, we realize that we have not been alive until now; that, by comparison, all that has gone before has not been real. The film *The Wizard of Oz* goes along for a quarter of an hour until Dorothy arrives in the land of Oz, opens the door, and looks out into a world in glorious technicolor; and only then do we realize that we have been accepting the convention of filming in black and white, that we had not *missed* the true colors. This is how mythic moments in life retroactively transfigure our frame of reference.

Eliade tells how, when one "lives" the myth, "one is seized by the sacred, exalting power of the events."[95] He is speaking of "archaic man" and of particular ritual events; but what of ourselves? Do we find myths or make myths in our lives—or both, like Richard II? The argument for the former is the argument for the archetype: most deep passions and the matrix of circumstances in which they appear make immediate contact with what underlies the great myths. These evocative passions often sweep along in their flood the solid, banal details that are the flotsam and jetsam of human nature and human culture—particular colors, particular animals, particular geographical places—the grey pony on the Irish coast in *Riders to the Sea.*[96] Seemingly neutral, these things are highly charged with evocative detail to which we are helplessly drawn by a kind of centripetal force, just as Richard II experienced "the emotional surrender to a pre-conceived pattern of fictive passion."[97]

These patterns are archetypal, but they are not merely archetypal; they are colored with culturally specific and personally specific "manifestations."[98] The phallus may well be archetypal (for Jungians as well as Freudians, let alone the rank-and-file), producing an archetypal and instinctive response in real life as well as in myth; but it is always *someone's* phallus, someone with manifestations (a tone of voice, a taste for Beaujolais) or (to switch from the Jungians to the structuralists) someone structured within a context (a past, a social role). These are the banal details that, like Noemon's mule, make the myth real and also our own. The purely archetypal phallus does appear in some myths (the castrated, disembodied phallus that the Trickster keeps in a box until he needs it,[99] or the anonymous instrument of Erica Jong's "zipless fuck"[100]), but even here one has the details of the frame (what kind of a box, what kind of zipper?).

Shakespeare uses actual historical details to link myth with history, details that "remind us of the accidental objects which are there all the time for us to stub our toes against. . . . Paradoxically, the more actual the history . . . the more it becomes a kind of mythology with almost magic properties."[101] Herodotus did it too. In narrating the birth of Cyrus, he makes use of the standard archetypal motifs of the birth of the hero: the slaughter of the innocents, the highborn child secretly transferred to shepherd stepparents, and the death of the shepherd child as a sacrificial substitute for the future king. But then Herodotus vividly imagines the state of the mind of the shepherd mother whose own child had been stillborn:

> When she saw the child so big as it was, and so beautiful, she burst into tears, and taking her man's knees begged him by no means to expose the child. . . . "For you shall not be caught wronging your masters, nor shall we have laid our plans ill. Our dead child will receive a royal burial, and the child that survives will not lose its life."[102]

This human insight, like Yashodha's tenderness toward the child-god Krishna, makes the myth true for us, makes it both more mythic and more persuasive.

Even when we feel that we are finding a myth with all its details right in our lives, we are also making the myth by framing it with nonarchetypal details in order to see it, just as films about invisible people have to put clothes or paint on them so we can tell they are *not* there. But because we know how the myth goes, we then ignore those details in selecting the mythic elements of the event as the ones that are real. And we select elements that can be naturally structured in a pattern that is mythic, a pattern of repetitions and irony and paradox, as we focus on the events and details and patterns that are such stuff as myths are made on.

Some people, the kind we often refer to as self-dramatizing, regard every moment in an apparently ordinary life as mythical; but other people really do seem to have mythical lives, just as some paranoids really are surrounded by malicious enemies. Shakespeare paints Richard II as self-consciously aware of the fact that he is acting out a myth. To some extent he has this thrust upon him (as a figure of great political power and personal charisma); but he also achieves "myth-hood" by his own perception of his life and his ability to project this perception into the minds of the people around him, as the Wizard of Oz made everyone in the Emerald City wear green-tinted glasses so that it *became* the Emerald City. Mythic events seem to happen more often to people who believe in the mythic dimension, who seek it out and allow it to break in on them; or perhaps people who live through many such events become converted, even against their own common sense, to a belief in the reality of myth. Though the myth does not tell us what to do in such situations, it does at least enable us to recognize them, to value them, and ultimately, as Rilke says, to let them change our lives.

Because, or in spite, of our conscious attempts to live a myth, or to live against a myth, mythical patterns lay hold on us when our passions reach the spot at which the myth originally asserted itself. "Archaic man"—the man who lives his myths—is an endangered but not yet extinct species. Eliade writes: "At a certain moment in history—especially in Greece and India but also in Egypt—an elite begins to lose interest in this divine history and arrives (as in Greece) at the point of no longer believing in the *myths* while claiming still to believe in the *Gods.*"[103] The problem for us now is quite the reverse: we no longer have the gods, but we still sense the truth of the myths. There is a second way in which the new "archaic" man differs from the Eliadean prototype: *in illo tempore,* the man who lived the myth lived it in a group and in a shared, traditional ritual; now, as the myths of the inversion of social charter demonstrate, one must live the myth *against* the group, surrendering to disturbing and totally personal emotions that often threaten one's existence as a social creature or one's common sense as the creature of realism and materialism. Ours is a lonely mythology of atheism and solipsism; we find it not in churches but in films, comics, and our own experience.

Myth in this sense is both solitary and communal: solitary, in that the mythic experiences are among the most private and highly personal; communal, in that they are experienced by all of us. Lévi-Strauss describes the paradox in somewhat different terms:

> It is a consequence of the irrational relation between the circumstances of the creation of the myth, which are collective, and the particular manner in which it is experienced by the individual. Myths are anonymous: from the moment they are seen as myths, and whatever their real origins, they exist only as elements embodied in a tradition. When the myth is repeated, the individual listeners are receiving a message that, properly speaking, is coming from nowhere; this is why it is credited with a supernatural origin.[104]

We have seen that Lévi-Strauss's denial of a "there" anywhere but in the human mind leads him to objectify myth within the individual. Here he allows it to be drawn out into the community, with the result that the individual feels (wrongly, as Lévi-Strauss implies) that it is in fact coming from "out there." The communal role of the myth that has become absorbed in this way makes it into sacred history. Myth is "democratic history" transformed from tedious statistical generalization into a detailed history at once universal and personal —though it is, of course, a timeless history and hence hardly history at all in the usual sense of the word. Mythic man as I have defined him is remarkably similar to the nineteenth century Romanticist, the individual who stands apart from the group in his innocence and inspiration, and in his need to transcend limits;[105] but mythic man as Eliade defines him cannot exist except in a sacred community.

The loss of community has changed the role of myth in life. Many canonical stories no longer set in a sacred context are no longer taken seriously; the crucifixion has lost its power as a shocking mythic image. Meanwhile, where myth was once, for the rational Greeks and their heirs, a mere story, it is now regaining its meaning (at least for the secular individual); theology, by contrast, is losing its meaning for the individual outside the special ranks of sacred communities. Myth is now our secular, personal theology; we have nothing left to build our myths with but our own lives. In the Epilogue to Shaw's *Saint Joan*, when Charles dreams of meeting Joan after she has been burnt at the stake, he dreams that the chaplain apologizes for what has happened and says that, had he (the chaplain) actually seen it, as he has now, he never would have acted as he did. Pierre Cauchon replies, "Must then a Christ perish in torment in every age to save those that have no imagination?"[106]

We lack the imagination to be shocked by our own myths and are forced to learn mythic truths the hard way, by living through them. Yet, we can still be shocked by the myths of other people; hence, the truth of the old story, lovingly repeated by Martin Buber and Heinrich Zimmer, about finding your own treasure in the home of a stranger in a foreign land.[107] Within the myth, characters experience the mythic shock of recognition (Yashodha, Markandeya, Penelope), but we, the readers, see it coming and take it in our stride. (The myths of "common sense"—the pregnant male and the Trickster—are an exception to this, but they surprise us not through their insights but by moving outside of the conventional frame of reference of the myth.) The myth shocks the characters inside it because it is *about* shock; it narrates the shock, however, in totally familiar terms, and it narrates the same shock over and over again. Shock and recognition play at tug of war within the myth.

In traditional societies, as we have seen, the ritual functions as a physical, experiential complement to the myth, and these rituals do in fact subject the initiate to various shocks—physical torture (fasting, sleeplessness, mutilation), fear, and the symbolic experience of being swallowed and reborn. This is what the myth is about, the experience for which the myth has prepared not only the initiate but the community that shares vicariously in the ritual. In our world, where myth is bereft of ritual and has become a mere story—a religion deprived of a congregation—it has once again begun to draw to itself a kind of ritual and community, through the theatre and, less powerfully perhaps but certainly far more frequently, through film and "cult." Yet, the main arena in which the mythic shock of recognition takes place is in our own lives.

11. The Art of Myth: Bricolage

Sometimes personal myths are constructed piecemeal out of the evocative bits of archetypal flotsam and jetsam. These are in themselves self-selecting fragments: out of the many things that might happen in myths, remarkably few occur over and over. These recurrent fragments are what Lévi-Strauss has termed "mythemes," in recognition of the way they function like the phonemes in a language (or "my-themes" in life) or the atoms in a molecule: they are the building-blocks out of which any myth will be constructed. This process is also known as *bricolage*, since the mythmaker, like the French handyman of that name, works with the materials he is given, and must ingeniously construct any new item from the fragments of the old. Thus, when we make our lives into myths by censoring out the nonmythic materials and focusing on the mythemes, we are simply doing what the authors of the myths did in the first place; but now the elements with which we build are not words but "real" elements, the facts of our lives as *objets trouvés*.

These leftover scraps are curiously akin to the building blocks of animal life itself, not merely in terms of the metaphor of the atom, but also in the actual historical development of the elements. For evolution from time to time throws up nonadaptive scraps that have no purpose or survival value, that are not "necessary" in Laplace's (or Lear's) terms, and hence can be used extravagantly, *ars gratia artis.*[108] On another scientific plane, the Fourier transformations break down and reconstruct three-dimensional forms as the *bricoleur* breaks down a bicycle's seat and handlebars to make the head of a bull. And in the theatre we have seen Richard II building his abdication out of mythic scraps inherited from Christ, even as Shakespeare built his play on scraps from Holinshed.

Why are these fragments so limited in number? Why do we make use of such a small part of the available vocabulary, just as the snail forms his shell in so few of the shapes he might make? Wittgenstein maintained that, although logic is limited, emotion is limitless; but this seems to be untrue when applied to the emotional content of myth, in which (as in music) the number of archetypes is limited, perhaps because they are all general types and hence, by definition, absorb within themselves all minor variations (the manifestations).[109] Moreover, the discarded elements "are always present in latent fashion, behind those that have been singled out."[110]

These limitations apply to art as well as to myth. The artist mediates between the official mythmakers and our instinctive or self-conscious myth-construction in our lives. He is a *bricoleur* who builds out of the mythemes of his culture and his own individual genius a kind of metamyth; responding truly and artistically to patterns in the myths, tossed up by some fertilizing influence in his own experience, he creates out of a true symbiosis of his personal theme and some depth of meaning that he has discovered in the myth. Since the myth arises in the first place as a spontaneous growth in the human consciousness, shaped by the basic artistic impulse, the instinct of the great artist is merely a later stage of the same process, strengthening and extending the life of the myth. The Greek tragedians have been accused of having had a sinecure in inheriting the myths full-blown;[111] but all artists inherit myths and rework them to greater or lesser degrees, explicitly and creatively (as Shakespeare does, or Yeats) or subconsciously and, often, tritely (as do many hack novelists and writers of science fiction).

We have seen how the bard in the *Odyssey* weaves the elements of his life (as an actor in the episode of the suitors' revenge) together with his traditional art (as the narrator of the tale). In the Indian epic, too, the sage Vyasa both tells the story and plays a key part in it (begetting several of the protagonists and performing rituals that turn the tide of affairs). On the other side of the barrier, Kekulé's "enlightenment" about the circular molecular structure of benzene was a combination of the traditional, mythic meaning of the snake biting its tale and certain events of his own life. The artist or inspired scientist must cross over the barrier into both his own unconscious and the traditional archetype, entering the dangerous jaws of the devouring muse in order to bring back the prize he seeks.[112] The painter or musician builds out of the old archetypes, extending them into new realms, tinkering with the elements of *bricolage* as nature itself does in the process of evolution.

But the differences between the creative processes of scientists and myth-makers apply as strongly to individual fantasists and great artists, though here it is primarily a difference in the use of repetition and recognition. The critic may complain that archetypes in their raw state "are what children learn when they tediously reiterate nursery rhymes, intone tiresome chants, and make visual images that only fond parents delight in, psychiatrists regard as interesting, and Wordsworthian Romantics find profound."[113] One may perhaps question whether the raw archetypes are in fact so tedious to any but the most jaded tastes, but still one must admit that the true artist does use archetypes in a very special way.

"Genius all over the world stands hand in hand, and one shock of recognition runs the whole circle round."[114] For most people, the shock of recognition consists precisely in the inexplicable familiarity of the episode; for artists, the shock is both that and the shock of seeing the familiar in a totally new way, the aesthetic shock of surprise coupled with the personal shock of recognition. Personal fantasy, especially when obsessively neurotic, is sterile and mind-numbing in its repetition;[115] artistic fantasy is unique, infinitely various in the manifestations that it creates from the limited archetypes. Myth, midway between them, frames the archetype with just enough banal detail to make it real and to shock us with its familiarity, but aesthetic grace or originality is not essential to the persuasive power of myth. Lévi-Strauss has said that, while poetry is what is lost in translation, myth is what survives even the worst translation. This argument for the "artlessness" of mythology is somewhat more refined in Lévi-Strauss's assertion that myth is not so much opposed to poetry as able to mediate between the two opposed sign systems of music and articulate speech. In this model, though not everyone is a poet, "the vehicle of poetry is articulate speech, which is common property." Music, by contrast, depends on special gifts; and Lévi-Strauss has developed at great length the analogy between music and mythology. Thus, to the extent that mythology is "cultural," like music, it is artful; to the extent that mythology is "natural," like the colors present "naturally" before they are used by the painter, it transcends art.[116] On my continuum, mythology is precisely the point where nature and culture intersect, but to the extent that the natural or "real" element predominates, it is artless.

Myths, like the people we love, do not have to be beautiful or original in order to move us; the power of myth depends on the purity of the vision rather than the complexity of the words or painted lines that express the vision. The artist makes use of this power and his own creative powers of transformation: "The more original his work, the more imperiously recognizable it will be."[117]

12. Remembering the Myth

We have been talking about *how* myths affect us; now we can no longer avoid the question of *why* myths affect us. What is it that we are reminded of when we recognize the country of myth? This brings us back to the question with which we began: do myths remind us of passionate moments in life, or are those moments compelling because they remind us of myths? Which side of the mouth of God is reality on?

Inevitably, we find ourselves bumping into Plato, as Alice kept finding herself walking back in at the garden door in Wonderland. Despite Plato's profound distrust of the power of myth, he is largely responsible for the survival of the theoretical structure in which myths are accepted as real. C. S. Lewis's Narnia is the land of Platonic forms:

> Our own world, England and all, is only a shadow or copy of something in Aslan's real world. . . . And of course it is different; as different as a real thing is from a shadow or as waking life is from a dream. . . . This is the land I have been looking for all my life, though I never knew it till now. The reason why we loved the old Narnia is that it sometimes looked a little like this.[118]

And, as Lewis has the grace to have the old professor remark, "It's all in Plato, all in Plato: bless me, what *do* they teach them at these schools!"[119]

If one is not willing to go all the way with Plato (that is, if one does not really believe in the existence of a world of ideal forms, in the existence of something "out there"), one is likely to be thrown back upon Jung. The idea of a collective unconscious transmitted like genetic information in the brain is no longer quite so fatuous as it once seemed; the brain does in fact appear to be able to hand down simple archetypes, though not complex ones (another point in favor of the fragmentary mythemes),[120] and the Jungians may turn out to be right when they suggest that "we all have the same kind of dragons in our psyche, just as we all have the same kind of heart and lungs in our body,"[121] though there is still no "scientific" evidence that this is so. A more modest likelihood is that, out of a universal biology and a universal experience on the planet Earth, we all generate again and again the same dragons (the variations in dragons corresponding to the considerable variations in biology and experience).

However, one is then left with the problem of explaining why we *feel* that we are being reminded of something when in fact there is nothing "there" to be reminded of. As Markandeya says when he falls out of Vishnu's mouth, "I think I have seen this before." He has, of course; this is the second time he has fallen out of Vishnu's mouth, though he forgot the first experience (as Yashodha forgets hers). What he finds inside Vishnu's mouth is his memory of the first time. The mythic hero wins his memory of the past by being swallowed by the God(dess), by entering the womb-jaws of hell; this is the treasure guarded by the dragon at the barrier.

In Eliade's view, the hero journeys to win the memory of the past so that we may reenact that past in recreating the myths. For Eliade, what we "remember" is the ancient time when the myth was first made real, rather than a world of ideal forms or a racial memory: "Myth assures man that what he is about to do *has already been done.*" In his view, this is a collective journey, and a collective memory is won by it (the traditional, archaic model of myth). But a different, individual journey, a kind of concrete journey into the past to retrieve memory, is the object of the psychoanalytic trip. Eliade compares Freud's belief that through memory, or a "going back," one can relive certain traumatic incidents of early childhood with the collective "going back" into the primordial events of myths: "Psychoanalytic technique makes possible an individual return to the Time of the origin."[122] This, too, is an individual journey that may involve the rejection of a social charter—the rebellion against the imprint given by one's parents.

Both Eliade and Freud seek for the memory of actual, lived events: Eliade, for those lived traditionally and culturally and preserved in ritual; Freud, for those actually lived by the individual doing the remembering. Yet, Eliade in his own life sees the two memories inextricably tangled. He concludes his memoirs with a reflection on the nature of the autobiographical journey, "a journey which takes place across different landscapes, forms, and colors, arouses a series of associations just as precious for the secret history of the soul as are, in Jungian analysis, the associations brought about by hearing certain words, names, legends, or myths, or as is the contemplation of certain paintings or drawings."[123] For the myths speak of a different kind of remembering, the recognition of a country where neither the individual nor the group has ever been before. Mythic memory, unlike "normal" memory, can remember things that have not yet happened, like the two-way memory of the White Queen, who remarks, "It's a poor sort of memory that only works backwards."[124]

The sense of *déja vu* haunts the uncanny osmosis between myth and reality. If one wishes to make it canny, to expose it to the criteria of common sense, one might call upon neurophysiology, from which we learn, first of all, that *all* thought is memory and the patterning of memory. Moreover, because memory is distributed throughout the brain, "in some circumstances a distributed memory might be 'confused' in the sense that it will respond to new events as if they were seen before, if the new event is similar to ones that have been previously seen. It will 'recognize' and 'associate' events never, in fact, seen or associated before."[125] *Déja vu* is thus somewhat akin to the setting off of a burglar alarm when a cat steps on a wired surface; the "I remember" system is activated by an experience that should properly be shunted into the "I am seeing this for the first time" department. This explains, perhaps, the power of *personal* manifestations of *déja vu* (triggered by mechanisms such as Proust's *madeleines*), but it does not explain why certain archetypes that are rarely viewed (the grey pony by the sea) "confuse the distributed memory" in so many of us, while other images encountered far more frequently (a cocker spaniel on a sofa) do not.

The structure of myths reinforces the mental rhythms of memory, for we *have* heard the story before (over and over, in a traditional culture); as A. K. Ramanujan remarks of the Indian epic, "No Indian ever hears the *Mahabharata* for the first time."[126] Moreover, we have heard the episode before in earlier, parallel episodes of the same myth (the slightly varied leitmotivs of the adventures of each of seven brothers), and, on the most basic level, we have heard the same words before (in the formulaic structure of ritual speech).

Repetition is what makes the myth real, by setting up a pattern at variance with, but ultimately parallel to (and hence able to replace), the repetitions given by experience. Though crude repetition is poison to art and superfluous to science, artful repetition is the lifeblood of art and the security blanket of science. "A child seems willing to accept any connection, marvelous or trivial, if it is repeated and part of his world," even such a marvelous fact as the push of a button producing talking images on a television screen.[127] In personal fantasy, too, the enduring patterns are not merely the pleasant and the traumatic, but those that are repeated over and over, regardless of their content.[128] In myth, as in science and fantasy, or as in the Bellman's statements about the Snark, "what I tell you three times is true."[129] This "illogical but magically compelling repetition"[130] does not become tedious in myth; it becomes sacred.[131] Indeed, only when we meet it for the second time is it sacred, retroactively, the first time.

Charles H. Long's definition of myth is illuminating in this regard: Myth is the attempt to experience again what we never experienced in the first place.[132] We have the feeling of doing something for the second time—in life, as in myth—when we confront for the first time something that speaks to a special core of passion and understanding. People who live a substantial part of their lives in contact with that core seem to bypass many of the first times, like bright children who skip first grade and begin in second without missing anything. People who are familiar with myths recognize mythic moments in life when they encounter them for the first time, and people who have experienced and understood passion in their lives are not surprised by the things that happen in myths.

13. *Myth as Child's Play*

Given this pervasive quality of memory and recognition in myths, how can we explain the equally pervasive presence of children in them—for children are the ones to whom everything happens for the first time. Children appear in myths all the time: they experience the theophany that is denied to adults, and they are the (real) counterpart of the audience of the (mythic) theatre of Aristophanes; gods appear as children in myths; and the world of children is the one sought by the psychoanalytic journey. Myth has always been associated with children, though for different reasons at different times: in the ancient world, children were regarded as the pure medium through which religious ideas became manifest ("out of the mouths of babes"); in our time, though we still pay lip service to this idea, children are generally regarded as the only people foolish enough to believe in fairy tales and superheroes (the last survivals in the mythology of atheism).

The myth would thus seem to be an inversion of reality, as is often the case: in real life, children do *not* recognize recurrent experiences (since, to them, such experiences have not yet occurred for the first time), and in myth they do. To have a child see the first time as the second time is a logical paradox, like calling World War I by that name in 1918. The child's freshness of vision is a function of the fact that everything is new to him.

But this vision is, in its own way, also a quality of the mythic world, for it emphasizes the "shock" aspect of the shock/recognition tension. Most people gradually adjust to successive, repeated sound stimuli (the rhythmic ringing of a bell, for example), so that the pattern of brain waves, disturbed at first by each stimulus, gradually subsides and ignores subsequent stimuli; but certain Zen masters continue to react to each ringing of the bell with the change in brainwave pattern characteristic of the first stimulus; to the Zen master, the second time is just like the first time.[133] This is the time frame of the child, who is truly shocked by the story that has come to be second nature to adult society.

But the myths are not composed and transmitted by children; they are the work of adults, who frame the child's view with their own, in a complex series of Chinese boxes: cynical adults tell myths to children, whom they regard as naively gullible, and these myths are about children who experience true mythic realities that are foolishly ignored by the adults in the story. The adult viewing the myth of the child (or viewing his own child experiencing a mythic event—seeing the ocean for the first time, falling in love for the first time, or hearing the myths that the adult loved as a child) experiences a kind of temporal double-exposure: he feels the event as the first time for the child, and as the second time for himself. This double exposure is closely akin to the sensation of *déja vu:* the adult recognizes what shocks the child.

The child, in myth or reality, cannot respond to the hierophany with "common sense" or with a memory of actual events; he can only accept it on its own terms. Thus, perhaps the final reason for the importance of children as keepers of the mythic vision is our belief that they have not yet ineradicably inked in the boundaries in their map of myth and reality, that they have not yet learned to point out portions of experience as Not Possible or Not Important or, finally, Not Real.

14. The Translation of Reality into Reality and Myth into Myth

We say that children understand the language of myth, and in *Mary Poppins* the children cease to understand the mythic world, the language of sunbeams and starlings, as soon as they learn to speak a "real" language. In many ways, myth is the opposite of language, despite the etymological basis of the word we use to describe it in English and other European languages (from the Greek *mythos*, "speech"). Lévi-Strauss's remark about the ability of myth to survive bad translations supports our contention that myth takes place on a level of experience where words are both inadequate and superfluous, where logic and reason are misleading rather than revealing. Though this appears to fly in the face of Lévi-Strauss's description of myth as an instrument of logic, it is quite compatible with his analogy between myth and music. For, though he shows us that myths are "good to think with," this does not rule out the function that we have seen in the myths of the mouth of God: that myths are also good to *feel* with. Myth is a way of expressing inexpressible paradoxes, says Lévi-Strauss.[134] Myth is a way of expressing the ineffable.

Yet we can best understand our own myths, and those of other people, by translating them into other myths,[135] by drawing them back into that internal hub where our own reality, our own nature, intersects with the myths preserved by tradition, by culture. This provides, in passing, a way of translating myths, but it also provides a means of addressing the far more serious problem of translating reality, of establishing a vocabulary with which to understand what goes on in the heads of other people. Properly understood, myths provide a conceptual system through which we may understand and thereby construct a universal reality, a roundhouse where we can move from the track of one person's reality to another's, passing through the myth that expresses them all.

We cannot communicate the manifestation, but we may move back through it to the archetype. If you fall in love and introduce the man to your parents, they may hate him, but if they can remember how it felt to be in love, they can share your private myth. If you read a book that changes your life and you give it to your friends, they may be baffled or bored by it, but it might remind them of the books that changed *their* lives. We share the structures on this level, and on another we share the fragments, the mythemes, with which the structures are built. The scientist may argue that "existential understanding is essentially private, while scientific understanding is essentially and eminently shareable,"[136] but we have seen that neither of these propositions is entirely true; existential (mythic) experience and scientific (common sense, real) experience have both the same limits and the same ability to transcend limits of communication. It all depends on what one is looking for. The Jungian assumption that "we all have the same kind of dragons in our psyche" leads to the hope that "we can communicate, that alienation isn't the final human condition, since there is a vast common ground on which we can meet, not only rationally, but aesthetically, intuitively, emotionally."[137] Lévi-Strauss says that his ambition is "to discover the conditions in which systems of truths become mutually convertible and therefore simultaneously acceptable to several different subjects."[138]

Even without the assumption that there is something "in there" (let alone "out there"), myth can be an instrument for the translation of reality into reality. The myths of the mouth of God provide a mirror image of conventional social evaluations of what is real and what is not real, denying not only the claims of society but even those of *soi-disant* physical reality as defined by Newtonian science. The historians have demonstrated that there is no such thing as an even theoretically impartial observer, and the anthropologists have cynically undermined our hopes of getting inside the heads of other cultures, relativistically or otherwise.[139] The linguists and philosophers have, finally, hopelessly defamed the character of language as a possible vehicle for mutual understanding.

So we are stripped down to our naked myths, the bare bones of human experience. They are, perhaps, our last hope for a nonlanguage that can free us from these cognitive snares, a means of flying so low, so close to the ground of the human heart, that they can scuttle underneath the devastating radar of the physical and social sciences. Indeed, the same growing skepticism that has tended to disqualify these sciences as arbiters of reality has, as we have seen, begun to make peace between the rational Establishment and the irrational guerrilla enclaves of myth that have so often raided scientific territory. For now that we have been challenged to relax our stranglehold on inherited Enlightenment maps of reality on this side of the mouth of God, we may be able to make use of mythic maps that chart a very different kind of enlightenment on the other side. Better yet, we may pull back the illusory curtain between them once and for all.

REFERENCES

[1] These and other generalizations in this essay can be supported not only by the few examples I have mustered here, but by numerous specific examples from the larger corpus of studies in mythology I have published elsewhere, particularly in *Asceticism and Eroticism in the Mythology of Siva* (New

York: Oxford University Press, 1973); *Hindu Myths* (Harmondsworth: Penguin, 1975); and *The Origins of Evil in Hindu Mythology* (Berkeley: University of California Press, 1976). Many of the perceptions reproduced here as my own arose out of tactful but sharp criticisms of early drafts of this paper by the other participants in this symposium and by friends, colleagues, and students, particularly William K. Mahony, Brian K. Smith, and David Grene.

[2] Claude Lévi-Strauss, *Structural Anthropology* (New York: Basic Books, 1963), p. 229; *The Savage Mind* (London: Weidenfield and Nicolson, 1966), p. 22; *The Raw and the Cooked* (New York: Harper & Row, 1969), pp. 340-1.

[3] Lewis Carroll, *Through the Looking-Glass and What Alice Found There* (London: 1872), ch. 6.

[4] See below, sections 7-9.

[5] See below, section 14.

[6] See the essay by Leon Cooper in this volume.

[7] Problems that arise from the definition of myth as map are alluded to by Jonathan Z. Smith in "Map Is Not Territory," pp. 289-309, in his volume of essays by the same title (Leiden: E. J. Brill, 1978).

[8] This is the standard operating procedure for the reconstruction of hypothetical proto-Indo-European language and culture.

[9] For dreams and the theatre, see below, section 3; for children's books, section 13; for art, section 11; for experience, section 10.

[10] See below, section 14.

[11] *Bhagavata Purana* 10. 8. 21-45. Here and throughout this essay I have summarized rather than translated in full. The complete text of this myth appears in O'Flaherty, *Hindu Myths*, pp. 218-21.

[12] A similar episode is described in the *Bhagavad Gita* (11. 7-30 and 41-44), when Arjuna sees within Krishna's mouth a doomsday fire that swallows up the gods, crushing them between his jaws; in abject terror, Arjuna begs Krishna to return to his usual form, to be like a father with a son.

[13] *Matsya Purana* 167-8. A full translation of this myth appears in *Classical Hindu Mythology* by Cornelia Dimmitt and J. A. B. van Buitenen (Philadelphia: Temple University Press, 1978), pp. 253-6.

[14] Though Arjuna is male, he ends up outside Krishna and, like Yashodha, forgets the vision of being swallowed, for he must go on being involved in the world of action; this is the whole point of the *Bhagavad Gita*.

[15] For doomed females, see, for example, *Kalika Purana* 49-54, translated and discussed in O'Flaherty, *Asceticism and Eroticism*, pp. 205-9, and O'Flaherty, *Women, Androgynes, and Other Mythical Beasts* (Chicago: University of Chicago Press, 1980), pp. 93-96. For saved males, see the analysis of this tale of Vishnu and Markandeya in Heinrich Zimmer's *Myths and Symbols in Indian Art and Civilization* (New York: Pantheon, 1946), pp. 35-53, and the tale of Indra and the ants (in which Indra, like Arjuna, backslides at the end), also told by Zimmer (Ibid., pp. 1-11).

[16] *Mahabharata* 12. 278. 1-38 and 1. 71-72. These texts are translated, the first briefly, the second in full, in O'Flaherty, *Hindu Myths*, pp. 297, 280-9, and discussed in O'Flaherty, *Women, Androgynes*, pp. 264-72.

[17] *Padma Purana* 6. 18. 82-90. Also discussed in O'Flaherty, *Women, Androgynes*, pp. 267-8.

[18] *Odyssey* 12. 91-93 for Scylla. For other examples, see Mircea Eliade, *Rites and Symbols of Initiation: The Mysteries of Birth and Rebirth*, Willard R. Trask (tr.) (New York: Harper, 1958; Torchback, 1975), pp. 35-36 and 51-52.

[19] I am indebted to James Redfield for this insight into the *Bacchae*.

[20] See O'Flaherty, *Women, Androgynes*, passim.

[21] See numerous articles by Jung and Eliade, as well as Dorothy Eggan, "The Personal Use of Myth in Dreams," in *Myth: A Symposium*, Thomas Sebeok (ed.), (Bloomington, Ind.: Indiana University Press, 1958), pp. 67-75, and *Myths, Dreams, and Religion*, Joseph Campbell (ed.) (New York: Dutton, 1970). See also the cyclic relationship between personal fantasy and collective myth discussed by Meredith Skura in this volume.

[22] Mircea Eliade, *Myth and Reality* (New York: Harper & Row, 1963), p. 77 n.

[23] Chuang Tsu, ch. 2, "The Equality of Things and Opinions," 2. 1. 2. 11.

[24] St. Augustine tells such a story in chapter 18 of *The City of God*. A philosopher appears to a man in a dream and expounds to him certain Platonic passages. When the two meet later, the philosopher tells the man that he (the philosopher) had merely dreamt that he had explained the passages to the man.

[25] This matter-of-fact modification of the traditional mythical beast is a Woody Allen speciality: "The great roe is a mythological beast with the head of a lion and the body of a lion, though not the same lion." Woody Allen, *Without Feathers* (New York: Warner Books, 1976), "Fabulous Tales and Mythical Beasts" (first published in *The New Republic*), p. 193.

[26] Ibid., pp. 192-3.

[27] Carroll, *Through the Looking Glass*, ch. 4 ("Tweedledum and Tweedledee") and ch. 12 ("Which dreamed it?").

[28] Jonathan Z. Smith discusses this "incongruity" as a function of the intersecting territories in a myth in "Map Is Not Territory."

[29] Russell Hoban, *The Mouse and His Child* (London: Faber and Faber, 1969), pp. 34-35, 67-80 (where "The Last Visible Dog" is a play that satirizes Becket), 120-6 (where the mouse child uses the image as a yantra to meditate on nothing and infinity), and 190-200 (where it is used as a symbol for the final resting place).

[30] See below, section 4.

[31] See below, section 12.

[32] David Grene, *Messenger Lectures.* I am grateful to Professor Grene for permission to see and cite the manuscript of his expanded Messenger Lectures, now in press under the title *Shakespeare: Theatre and the World of Politics.*

[33] See the discussion by Judith Shklar in this volume. As Lévi-Strauss remarks in *The Raw and the Cooked* (p. 13) "History . . . can never completely divest itself of myth."

[34] Grene, *Shakespeare: Theatre and the World of Politics.*

[35] Rupagosvamin's *Bhaktirasamritasindhu* 2. 27. I am indebted to David Haberman for this source. See also my discussion of it in *Women, Androgynes*, pp. 87-88, and cf. also *Bhagavata Purana* 3. 25. 34.

[36] *The Frogs*, 1194. Aeschylus seems to pity Oedipus as much for taking to bed an *old* woman as for the fact that she happened to be his mother.

[37] Euripides may be implying a contrast between the story of Stheneboia, which was not true and therefore drove women to commit a real act of self-destruction, and the story of Phaedra, which was true and therefore either did not lead to such an act or would have been justified even if it did.

[38] Plato, *The Republic*, 571 d., 573 b., 378 a.

[39] Sophocles, *Oedipus Rex*, 981-3.

[40] *Odyssey* 15. 560-5.

[41] For evidence that Greek mothers and sons did in fact wrestle with this problem, see Philip Slater, *The Glory of Hera* (Boston: Beacon Press, 1968).

[42] Aristophanes, *The Frogs*, 141, 149, 274.

[43] Bronislaw Malinowski, "Myth in Primitive Psychology," published in 1926 and reprinted in *Magic, Science, and Religion* (New York: Doubleday, 1954), p. 108.

[44] I am indebted to Judith Shklar for this realization.

[45] See H. J. Rose, *A Handbook of Greek Mythology* (New York: Dutton, 1959), p. 108. So, too, Arjuna returns, after being "swallowed" by Krishna in the *Gita* epiphany, to function as the Hindu hero par excellence.

[46] See the discussion of this function of history by Judith Shklar in this volume.

[47] Claude Lévi-Strauss, "The Story of Asdiwal", in *The Structural Study of Myth and Totemism*, Edmund R. Leach, (ed.) (London: Tavistock, 1967), pp. 29-30; and Edmund R. Leach, *Lévi-Strauss* (New York: Viking Press, 1970), p. 57.

[48] O'Flaherty, *Women, Androgynes*, pp. 271-2.

[49] See below, section 10.

[50] G. Morris Carstairs, *The Twice-Born* (Bloomington, Ind.: Indiana University Press, 1958), pp. 156-67. Also, O'Flaherty, *Women, Androgynes*, pp. 114-5.

[51] See the article by Meredith Skura in this volume.

[52] David Grene, personal communication, August 4, 1979.

[53] Lévi-Strauss, *Structural Anthropology*, p. 229; *The Savage Mind*, p. 22.

[54] Rainer Maria Rilke, "Archaïscher Torso Apollos," *Neue Gedichte: Anderer Teil* (Leipzig: Insel Verlag, 1908). Ursula K. Le Guin also applies this line to the function of myth in *The Language of the Night: Essays on Fantasy and Science Fiction* (New York: Putnam, 1979), pp. 77-78. The chapter "Myth and Archetype in Science Fiction" first appeared in *Parabola* I (1976): 4.

[55] Eliade, *Myth and Reality*, p. 149.

[56] Xenophanes B 11-12, Jaeger translation. Cf. also Plato, *Republic*, 377 b-d.

[57] This is the tip of the iceberg of the Greek approach to the problem of evil or theodicy. For a comparison with the Indian view, see O'Flaherty, *The Origins of Evil in Hindu Mythology*, and for an analysis of the Greek view, see Paul Ricoeur, *The Symbolism of Evil* (Boston: Beacon Press, 1969).

[58] Eliade, *Myth and Reality*, p. 148. I was caught up in this degraded use of the word "myth" when a Hindu (K. S. Narayana Rao) reviewing my *Hindu Myths* (in *Books Abroad*, 1976, p. 474) began by taking me to task thus: "The title is offensive. To the Hindu, the stories of his sacred literature are not myths; they are as much a reality and are as sacred as are the stories of the miracles of Christ or of Adam and Eve and Noah to the Christians."

[59] Eliade, *Myth and Reality*, p. 8.

[60] Cf. Zimmer, *Myths and Symbols*, pp. 35-53. For examples of attempted proofs of the reality of previous incarnations, see O'Flaherty, *Karma and Rebirth in Classical Indian Traditions* (Berkeley: University of California Press, 1980). For the Japanese story, see Richard M. Dorson, *Folk Legends of Japan* (Tokyo and Rutland, Vt.: C. E. Tuttle Co., 1961 and 1962).

[61] The *Yoga-Vasistha-Maha-Ramayana*, attributed to Valmiki (2 volumes, Bombay: Nirnaya Sagara Press, 1918), 3. 104-22. Quotation from Sir Thomas W. Arnold's catalogue of the Indian miniatures in the Chester Beatty collection (revised and edited by J. V. S. Wilkinson, 3 volumes, Oxford: Oxford University Press, 1936, p. 24), which has an illustrated manuscript of this text.

[62] Lévi-Strauss, *The Raw and the Cooked*, pp. 10-11 and 341.

[63] See the essays by Karl Pribram and Leon Cooper in this volume.

[64] *Odyssey* 2. 330-70; 4. 653-6.

[65] The term was coined by Leon Festinger in *A Theory of Cognitive Dissonance* (Palo Alto: Stanford University Press, 1957) to refer to the way in which people continue to maintain essential beliefs even when these are flatly contradicted by the failure of their predictions, a close analogy to the way that people hang on to myths in the face of the lack of supporting physical evidence.

[66] *Odyssey* 22. 205-38.

[67] *Odyssey* 1. 323; 3. 371-464.

[68] *Odyssey* 24. 438.

[69] *Mahabharata* 3. 54. 20-24.

[70] Cf. O'Flaherty, *Women, Androgynes*, pp. 95-96.

[71] See the essay by Stanley Cavell in this volume.

[72] Don Marquis, *archy and mehitabel* (New York: Doubleday, 1930), "xxxiii. ghosts," p. 135.

[73] P. L. Travers, *Mary Poppins Comes Back* (New York: Harcourt, Brace and Co., 1945), pp. 108-9.

[74] P. L. Travers, *Mary Poppins* (New York: Harcourt, Brace and Co., 1934), pp. 139-42.

[75] *Tantropakhyana* 10. Text and translation by George T. Artola, *Adyar Library Bulletin* 29 (Madras: 1965), 1-4; cf. the Tamil version, pp. 113-4 of the same issue.

[76] *Mahabharata* 3. 126. 1-26.

[77] For these and other unchallenged myths of male pregnancies, see O'Flaherty, *Origins of Evil*, pp. 342-4, and *Women, Androgynes*, pp. 299-326.

[78] *Saura Purana* 62. 5-12.

[79] The story up to this point is very similar to a Tibetan tale in which the Trickster figure constructs a vagina out of the lung of a sheep and uses it successfully to have sexual intercourse with a rich man's son. See *Tales of Uncle Tompa*, compiled and translated by Rinjing Dorje (San Rafael: Dorje Ling, 1975), pp. 24-27.

[80] Paul Radin, *The Trickster* (New York: Schocken Books, 1972), pp. 22-23.

[81] Alan Dundes, "Earth Diver: Creation of the Mythopoeic Male," *American Anthropologist*, 64 (1962), pp. 1032-1105. Reprinted in Alan Dundes, *Analytical Essays in Folklore* (The Hague: Mouton, 1975), pp. 130-45.

[82] O'Flaherty, *Women, Androgynes*, pp. 264-73.

[83] O'Flaherty, *Asceticism and Eroticism*, p. 223.

[84] See Reference 12, above.

[85] See the essay by Leon Cooper in this volume.

[86] Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1970).

[87] See below, section 11.

[88] From an earlier version of the article by Leon Cooper that appears in this volume. That scientists do, in fact, believe in things that are not "necessary" is brilliantly mocked in Hilaire Belloc's poem about the microbe, said to have seven tufted tails and other detailed characteristics, including "eyebrows of a tender green;/ All these have never yet been seen—/ But Scientists, who ought to know,/ Assure us that they must be so./ Oh! Let us never, never doubt/ What nobody is sure about!" (Hilaire Belloc, *More Beasts for Worse Children*, "The Microbe," London: 1898; Harmondsworth: Puffin Books, 1964, p. 96).

[89] Shakespears, *King Lear*, II. iv. 267.

[90] See ret. 14 of Leon Cooper's essay in this volume.

[91] See the essay by Karl Pribram in this volume, and cf. also Fritjof Capra, *The Tao of Physics* (London: Wildwood House, 1975).

[92] See the essay by Stephen Jay Gould in this volume.

[93] Lewis Carroll, *Through the Looking Glass*, ch. 5 ("Wool and Water").

[94] C. G. Jung, *Answer to Job* R. F. C. Hull (tr.) (London: Routledge and Kegan Paul, 1954), p. 75.

[95] Eliade, *Myth and Reality*, p. 19.

[96] John M. Synge, *Riders to the Sea* (New York: Random House, 1935).

[97] Grene, *Shakespeare*.

[98] Adolphe Bastion's terms (*Elementargedanken* and *Volkergedanken*) were taken over and modified by Jung.

[99] Radin, *The Trickster*, pp. 18-20. Cf. Uncle Tompa, pp. 9-16.

[100] Erica Jong, *Fear of Flying* (New York: Holt, Rinehart and Winston, 1973), p. 11, in which she refers to her "fantasy of the Zipless Fuck. The zipless fuck was more than a fuck. It was a platonic ideal."

[101] Grene, *Shakespeare*.

[102] Herodotus 1. 107-12. I am indebted to David Grene for this text and for the translation, which is his own.

[103] Eliade, *Myth and Reality*, p. 111.

[104] Lévi-Strauss, *The Raw and the Cooked*, p. 18.

[105] See the essays by Judith Shklar and Leonard Meyer in this volume.

[106] George Bernard Shaw, *Saint Joan* (Baltimore: Penguin, 1966), p. 154.

[107] Zimmer, *Myths and Symbols*, pp. 219-21.

[108] See the essay by Stephen Jay Gould in this volume.

[109] See the essay by Leonard Meyer in this volume.

[110] Lévi-Strauss, *The Raw and the Cooked*, p. 341

[111] F. M. Cornford, *The Unwritten Philosophy and Other Essays* (Cambridge: Cambridge University Press, 1950).

[112] On this point and also Kekulé's discovery, see the essay by Meredith Skura in this volume.

[113] See the essay by Leonard Meyer in this volume.

[114] Herman Melville, "Hawthorne and his Mosses," in *Collected Poems* (Chicago: Chicago University Press, 1947). The term "the shock of recognition" was used by Edmund Wilson for the title of his book on American literature.

[115] See the essay by Meredith Skura in this volume.

[116] Lévi-Strauss, *Structural Anthropology*, p. 210; *The Raw and the Cooked*, pp. 18, 27.

[117] Le Guin, *The Language of the Night*, p. 79.

[118] C. S. Lewis, *The Last Battle* (Harmondsworth: Penguin, 1964), pp. 153-5.

[119] Ibid., p. 154.

[120] Personal communication from Stephen Jay Gould.

[121] Le Guin, *The Language of the Night*, p. 79.

[122] Eliade, *Myth and Reality*, pp. 141, 78.

[123] *Mircea Eliade, No Souvenirs: Journal, 1957-1969*, Fred H. Johnson, Jr., (tr.) (New York: Harper & Row, 1977), p. 327.

[124] Lewis Carroll, *Through the Looking Glass*, ch. 5 ("Wool and Water").

[125] See the essay by Leon Cooper in this volume.

[126] Personal communication from A. K. Ramanujan.

[127] See the essay by Leon Cooper in this volume.

[128] See the essay by Meredith Skura in this volume.

[129] Lewis Carroll, *The Hunting of the Snark*, Fit the First, vol. 2. In *The Annotated Snark*, Martin Gardner (ed.) (Harmondsworth: Penguin, 1962), p. 46. Gardner points out that Norbert Wiener in *Cybernetics* discusses the duplication of neuronal mechanisms (as in distributive memory [see below, section 12]) and remarks, "Like the computing machine, the brain probably works on a variant of the famous principle expounded by Lewis Carroll in *The Hunting of the Snark:* 'What I tell you three times is true.' "

[130] See the essay by Meredith Skura in this volume.

[131] See the discussion of repetition and the sacred in S. G. F. Brandon, *History, Time, and Deity* (Manchester: Manchester University Press, 1965).

[132] Personal communication from Charles H. Long.

[133] Charles T. Tart, *Altered States of Consciousness* (New York: Wiley & Sons, 1969).

[134] Lévi-Strauss, *Structural Anthropology*, p. 229.

[135] "Conversations with Lévi-Strauss," by George Steiner, *Encounter* 27 (10) (April 1966): 38.

[136] See the essay by Karl Pribram in this volume.

[137] Le Guin, *The Language of the Night*, p. 79.

[138] Lévi-Strauss, *The Raw and the Cooked*, p. 11.

[139] See the essay by James Boon in this volume.

MEREDITH SKURA

Creativity: Transgressing the Limits of Consciousness

CREATIVITY AS TRANSGRESSING LIMITS: the myth is as old as the idea of creativity itself. Prometheus stole fire from heaven; Hephaestus, thrown out of heaven, cast his nets back; Orpheus stole his wife back from Hades; and gifted mortals like Arachne dared to compete with the gods. The rest of us are caught in familiar earthbound patterns, but the artist goes beyond what is known and allowed—and pays the price. Because for him, at least in our modern mythology, there is another kind of limit, the opposite kind—instead of too many rules, too few; instead of repetition, chaos and madness. The artist threads his way between the Scylla of routine and the Charybdis of insanity. But how true is the mythology? So far the scientific research has been piecemeal and is slow in accumulating. Nonetheless, recent research, especially the detailed psychoanalytic investigations of individual artists, has begun to suggest some answers to the questions about creativity's limits.[1]

There are few surprises in the outlines of the story psychoanalysis tells about the artist. In fact, they are the same ones present in the story of the hero who gave this journal its name: Daedalus, the fabulous artificer. Although Daedalus's reputation depends, like Leonardo's or Cellini's, on the variety of his clever inventions, he is, oddly enough, remembered for only three. And all three transgress the limits of human nature, reaching first below it to the monstrous passions often associated with madness, and then above it to the heavens. Daedalus fashioned an artificial cow for Pasiphae, Queen of Crete, so that she could satisfy her lust for the sacred bull from the sea. Out of that union came the Minotaur, half man and half bull, and it was to hide this monster that Daedalus built his famous labyrinth. Afterward, Daedalus made wings and learned to fly, an achievement whose potential threat to the gods is made clear in the fate of Daedalus's son Icarus, who flew too close to the sun and died. What is interesting here is that Daedalus, who *could* reach the sky, was the one who created an environment in which the monstrous could both thrive and yet be hidden. The elegant labyrinth on the cover of *Daedalus* leaves out the monster that was its source and center. But, like nature's labyrinth, the shell, although it looks aesthetically pure and independent, it is nonetheless inseparable from the lowly function it once served.

The general theories about creativity, described in the next section, are not very different from the myth. The psychoanalytic theory, described in the third section, is also similar, at least in outline. It tells how the artist integrates the ordinary world of conscious experience with the unconscious underground, though its image of the latter includes much more than animal passion; and it suggests that the artist's creations are in part shaped by the mundane, unaesthetic functions they once served. What psychoanalysis can add, however, are the details accumulated from individual analyses, to see in each case just how the integration is achieved, over the course of the artist's development, to shape his genius, and just how it takes effect at any given moment when he is working. Just *what* gets brought back from the other side, in what form, and why? Just *which* unconscious thought or which of yesterday's unconsciously noticed details comes back as tonight's dream or tomorrow's poem? Only by collecting details like these—the surprising exceptions to patterns—can we refine the myth that has been told so many times, it has almost frozen the imagination into a rut of its own, as if it were an end and not a beginning of explanation.

I

Creativity is too varied to be captured in any one definition. I will confine the discussion here to artistic creativity, broadly defined to include the creation of any new model for experience, not only novels and paintings, but certain visionary scientific discoveries as well. Despite the difficulty of explaining creativity, most researchers agree it can be recognized, at least by what it produces.[2] Creativity results in something that is new but appropriate; it adds something but fits into what is already there; it is not a creation *ab ovo* but a new way of putting Humpty Dumpty together. Current thinking about this process *does* tend to describe it as a transcending of limits, though the mythic flights are now more soberly portrayed as breaking out of conventional ways of thinking. By the time we grow up, most of us have sacrificed what creativity we had in the process of accommodating to society's rules and conventions. As Schachtel puts it in a representative study of this process, "The capacity to see and feel what is there gives way to the tendency to see and feel what one is expected to see and feel because everybody else does. Experience increasingly assumes the form of the cliché under which it will be recalled."[3] Schachtel cites a memory experiment in which subjects heard a strange Oriental tale; when they were asked to recall the story, they actually edited it, leaving out what is bizarre to a Western mind and shaping the plot as one of ours would be shaped. And, Schachtel reminds us, the same thing happens in everyday life. We live through a party only in terms of how we will tell our friends about it later, Emma Bovaries all, replacing experience by categories for it.

The creative act, then, escapes from these clichés; it is "the defeat of habit by originality," as Koestler defines it.[4] It is a change of gestalts,[5] a "bisociative" act in which something in one matrix is now seen as part of another.[6] This applies both to Kohler's protoscientist ape, who sees a branch and thinks, "I can use that for a stick if I just break it off the tree,"[7] and Gombrich's protoartist child, who sees a stick and thinks, "I can use that for a horse if I just get a bit of leather for the reins."[8]

Psychoanalysis comes in naturally, because, as in the myths, the escape from convention is thought to involve a detour through the other side of conventional sanity and consciousness. Creativity, as it is usually described, entails stages of preparation, incubation, illumination, and verification.[9] The first and last of these are self-explanatory—there is no question that the artist must be master of his techniques and conventions; the scientist, of his facts. But there are always the mysterious middle stages between them, and studies of creativity almost inevitably turn into reminders that there is something wild, dark, passionate on the other side of the boundary outlining sanity, reminders that we are divided selves, rent by an opposition we have tried to live with by finding formulas to contain it: Plato's mythology about a pair of horses pulling the chariot of the soul; the nineteenth century phenomenology of conscious and unconscious; or today's scientific physiology satisfying its "nostalgia for the simple mind"[10] by postulating a bicameral brain.[11] The creator crosses the line, scientists no less than artists. We have all heard the anecdotes, for example, about the chemist August Kekulé. He puzzled unsuccessfully over the elusive structure of the benzene molecule (he knew what its atoms had to be, but no alignment could be found that fit in with the facts of its behavior), until he fell asleep before the fire one night and dreamed about a snake biting its own tail, "whirling mockingly before my eyes." Then he knew the answer: the benzene molecule is a ring.[12]

But once past the description everyone agrees on, opinion diverges. The discussion of this strangely fascinating subject, about which everything seems to reduce to truism and yet nothing is understood, has generated a contradiction that theorists have come to take for granted. On the one hand, creativity is madness. Socrates believed it—"No one without a touch of the muse's madness will enter into the Temple of art," he said (and no one *with* it will enter into the Republic, of course). The reason still seems clear in modern times. As Nietzsche proclaimed, "One must harbor chaos within to give birth to a dancing star"—or even to give birth to a theory about stars, it seems, for visionary scientists, too, are understood to be somewhat mad. Psychoanalysis itself first linked art and neurosis, and first came to art with techniques designed for disease. What Freud taught about productions of the infantile, conflicted aspects of personality, it was thought, could help explain art—certainly, the first popularizations of Freudian theory in America came out of the hope that it could at last explain creativity.[13] "Creative Writers and Daydreaming" was the title of Freud's first essay on art (1908), and it was followed by others linking art with hysterical fantasies.

But almost immediately a countering theory emerged, one that has become increasingly popular in this century. Creativity is now seen as a sign of health. The artist draws spontaneously on the depths of his personality; for that very reason he is taken to be the model of the wholeness and sanity the rest of us have to work hard for in meditation and encounter groups. Creativity is not just a momentary feat leading to a poem or a painting; it has come to be seen as something infusing all of life, *lieben* and *arbeiten*. Creative integration of self—and self with world—has become the new definition of humanness. Man is no longer the rational animal but the symbol-using animal; that is, the creative one. The artist is his highest form perhaps, but we are all artists of the personal, avid readers of books on *Creative Marriage*, *Creative Divorce*, *Creative Loneliness*. Instead of worshipping creativity at a distance, researchers now anatomize it, with the goal of distributing it democratically to everyone. "At no other time in the history of measurement have there been so many attempts to operationalize creativity for its scientific measurement,"[14] as one put it. And the portrait of the artist sketched by their statistical studies reveals a formidably wholesome character out of the self-improvement books. He is perhaps a bit of a loner and somewhat obstreperous, but all this is in his control and is certainly worth it. For on the whole he is, like the architects in MacKinnon's often cited study,

> alert, artistic, intelligent, responsible, ambitious, capable, cooperative, civilized, dependable, friendly, pleasant, resourceful, active, confident, industrious, reliable, conscientious, imaginative, reasonable, enterprising, independent, with wide interests, adaptable, assertive, determined, energetic, persevering, sincere, individualistic and serious.[15]

The psychoanalysts had their own version of this second attitude toward creativity, again starting with Freud himself. For Freud, as Hyman complained, contradicted himself, and if at one time he claimed that the work of art could be reduced to the artist's neurosis, at another he claimed that it could only be understood as the product of the artist's neurosis *plus* his art, the latter being beyond the reach of analysis altogether.[16]

But as psychoanalysis evolved from a study of pathology into a general psychology, analysts began to distinguish between neurotic conflicts and the primitive qualities of mind that these conflicts made use of. Finally, Kris suggested what seemed then to be the inevitable resolution to the paradoxical view of the artist as both madman and model of sanity: the artist did have recourse to the primitive realms outside consciousness where neurosis (and psychosis) breed, but only to tame and bring back what he found there. Art involves regression to primitive states, but only, in Kris's famous phrase, "regression in the service of the ego."[17] Yet, the phrase is vague, and, despite its promise, it comes close to a tautological restatement of the original paradox: while Freud thought regression caused disease, in these cases, it works.[18]

Taking their lead from Kris's work, however, analysts have gone on to identify different aspects of regression—primitive emotions, primitive forms of thinking, primitive concerns. Disease involves a general regression, but art is selective. As Kubie put it in the best known version of this theory, there is a difference between regression to the "preconscious" and to the "unconscious." He quarrels with the looser and

> erroneous assumption that it is that which is unconscious in us which makes us creative, . . . in fact the unconscious is our straight-jacket, rendering us as sterile and repetitive as is the neurosis itself. . . . The goal to seek is to free the preconscious processes from the distortions imposed by the unconscious processes.[19]

In distinguishing preconscious from unconscious, Kubie is actually distinguishing regressive ways of thinking (by analogy and symbolism) from regressive fantasy content (what we think symbolically *about*). The regressive thought processes break out of everyday clichés because they work by analogy instead of logic. Dreams equate wife and mother, and dreamlike regressive thinking allowed Archimedes to equate the water splashing out of his bathtub with the measurable displacement of water that could be used to tell whether a crown was made of gold. These processes Kubie distinguishes from the regressive fantasies themselves, which are subject to their own clichés and which stifle creativity. Endlessly repeated fantasy battles, though unconscious, affect our conscious lives. In one scholar, unconscious fantasies about murdering a father must be undone over and over by obsequiously subduing any original ideas in deference to authority; or an infantile conflict about controlling water flow can lead an engineer to obsessively repeat one experiment and can shape his procedures regardless of the facts. The obsessively shy or obsessively loud ones, the phobics who cannot walk down narrow streets, all are acting out silent scenarios from unconscious fantasies hardened into necessary stereotypes of behavior.

In fact, some of the unconscious private clichés make use of the public ones, so that a dead metaphor in a clichéd social gesture, whose meaning we do not even think about, can lead a hidden double life as a private fantasy. Frau Caecilie, one of Freud's patients, for example, suffered from an apparently uncaused facial neuralgia—which turned out to be the clichéd "slap in the face" that people in her fantasies kept giving her.[20] By concentrating in a literal-minded way on the superficial meaning of the cliché, she did not have to worry about the complexity of the emotional experience to which it referred—and the dangerous response she might then have had. The conventions of social behavior, which save us from having to think out the proper response each time, can also save us from having to work through unconscious conflicts each time they come up. The neurotic need never think.

Yet, no matter how easy it is to demonstrate that personal clichés, like social ones, can paralyze the imagination, the antiseptic division between creative regressive thinking and uncreative regressive stories is a tricky one. Neither artists nor clinicians find it easy in practice to separate the thought processes outside full consciousness from the emotion-laden, primitive ideas that haunt regressive thinking. The ideas are there. As Bush reminds us, not just analogical thinking but also "repressed drives, wishes, and fantasies, unresolved unconscious conflicts, unmastered trauma and primitive modes of ego functioning play an important role in the most complex human behavior, interacting continuously with advanced levels of psychic functioning."[21]

Just a glance at some examples confirms that, although creative discovery may not entail lunacy, it is not a clean, objectively random process of contentless analogizing and associational thinking. The creative process is tendentious, even if it doesn't have a fully developed plot. Even the simplest examples show fantasies at work along with free associational thinking—those famous moments of inspiration, one-liners, and "Aha!" experiences that creativity studies cite. Mathematical solutions and lines of poetry seem to come out of nowhere, gifts from the gods to unwary creators in bed, bus, or bath, as Poincaré described it. But they often do have sources in specific fantasies.

Look at a moment of poetic inspiration described by Lewis Carroll. He claimed that he was walking on a hillside one day when "suddenly there came into my head one line of verse—one solitary line—'for the Snark *was* a Boojum you see.' "[22] Though the *Hunting of the Snark*, of which this turned out to be the culminating line, is minor, it is still an artful creation that successfully captures a specific experience in its nonsensical quest: traveling rudderless and mapless toward an unknown goal that might annihilate you. Carroll presents the line, and the poem that grew around it, as something without any cause or source at all, let alone any help on his part. But, as his diaries reveal, the hillside walk, during which the line appeared, was an escape from his cousin's bedside, where Carroll, despite his morbid fear of fits and breathing obstructions, was nursing the young man as he lay dying from a lung inflammation. The *Snark* is a consciously produced and consumed product, a mock epic whose humor perfectly suited the little girls Carroll was trying to please. But at the same time it described the type of expiration Carroll himself most feared; it is shaped by his underlying fantasy of deadly fits (the poem is divided into eight "fyttes") and of the dangerous snarks at the end of the quest. The last line, rather than coming from nowhere, comes from a fantasy that allays this fear somewhat, by distinguishing between ordinary snarks (perhaps not dangerous after all!) and boojums.

If Carroll's case seems unrepresentative—he was, after all, more disturbed and fantasy-ridden than many artists—there are similar ones even among rational scientists. Look again at Kekulé's dream about the snake swallowing its tail, the inspiration that led to the discovery of the benzene ring. Kekulé revealed this experience—and so it has always been taken—as proof that we should rely on the unconscious for inspiration. "Let us dream, gentlemen, let us dream," he concluded his narrative (though with due admonition about testing the dreams afterward). Nonetheless, it is not at all clear that just *any* random chemist's dream would have hit upon this startlingly appropriate image for the benzene ring. Perhaps the dream could have come only to someone prepared for it—someone not only steeped in the facts about benzene (and molecules), but someone who also had snakes on the mind. Our information about Kekulé's mind is limited, of course, but there are incidents in his biography that suggest he was not merely relaxing into preconscious thought processes when he fell asleep in front of the fire that night, but actively making a match between the facts about benzene and the facts and fantasies of his own past history.[23] The complexity of the dream's background makes it worth exploring in some detail here.

Kekulé tells about the dream, but he does not tell anything about its background. There was a fire that destroyed the house next to Kekulé's when he was eighteen, killing the countess who lived there. The local investigators, deciding that the episode constituted a deliberate murder, connected it with the simultaneous theft of the countess's jewelry—which included a ring in the shape of snakes biting their own tails. Eventually a trial was held, and Kekulé was called as an eyewitness. We have no way of knowing what he thought about all this, but some facts are clear: at the time of the fire he was preparing to study architecture at the university, a career chosen for him by his powerful father. By the time the trial came round, Kekulé had switched careers because he had been so impressed by Joseph Liebig, a chemist at the university, and he was already working on the paper he later presented for his doctoral dissertation. Liebig himself was called as a witness at the murder trial. It is not unreasonable to think that the snakes became associated in Kekulé's mind with the rest of what was going on in his life, for at the time Kekulé was hearing about the rings, he was in the midst of making this important choice and was living through what was to be a recurring conflict. He had recently abandoned his father's guidance for Liebig's—a new mentor whom he was also to desert just at the time of the trial; for Liebig had offered him a coveted lab assistantship, but against the great chemist's advice, Kekulé was to leave for Paris instead. During his life Kekulé made several pilgrimages to famous chemists but never remained with any of them. Actually, Kekulé's address to the Chemical Society, which is our source of information about the famous dream, is in large part an exhortation to young chemists to do as he did: follow in the footsteps and stand on the shoulders of their teachers, but always, always, to go beyond and to have no single one as master. (This address, incidentally, part of the twenty-fifth anniversary celebration of Kekulé's discovery, took place on the exact anniversary of that trial many years before. Though the conscious mind, of course, dismisses such connections, if primitive unconscious processes were working over past material, they would be sensitive to the illogical but magically compelling coincidence. Kekulé's lecture, as well as his dream, may draw on fantasies.)

Kekulé's ongoing conflicts, then, could have found accidental but apt representation in the ring stolen from the fire, in the snake with no beginning and no end outside itself—standing on its own shoulders perhaps. And it is possible that such conflicts were being reawakened at the time of the dream. Though Kekulé does not mention the context in which the dream was produced, we know that his young bride had recently died and left him with an infant son; Kekulé was suddenly a father himself and a potential mentor. In any case, being a parent and a teacher had kept him busy, and he had produced no papers of real importance for several years, but was working on a textbook for students. The dream came to him, in fact, one night when work on the manuscript was "not going well," and he had turned from it to stare into the *fire*.

The discovery that the snark was a boojum or the benzene ring a snake may seem to result from impersonal permutations and combinations of preconscious thinking, but in both cases it was actually the result of very personal, preconditioned, and eccentric ideas working illogically below the level of consciousness to reshape conscious thinking. The personal clichés that Kubie describes may well turn into straitjackets in many or even in most cases. But, as the art critic Ardian Stokes reminds us, "There would be nothing to art could it be exercised in despite of temperament," and temperament depends on those clichés. The private sources of creativity "bestow on much of art a quality of urgency and inevitability," which we recognize as part of it—and which "suggests that the aesthetic integration has been won from tendencies often hostile to any integrative role."[24]

It is not the presence or absence of clichés (conscious or unconscious) that determines creativity but the way they are used. On the contrary, as critics have been recently suggesting about the external clichés, even the greatest art begins in convention and depends on it by reworking and fighting against it. Shakespeare's uniqueness was long associated with his supposed originality, but scholarship has steadily undermined the myth of the unread genius. Shakespeare was a careful student of both the classics and his contemporaries; his genius lay partly in "his willingness to follow rather than to initiate," as Jones has put it.[25] He made *Hamlet* out of the tired revenge play tradition, and the romances out of "mouldy old tales." Of more interest here, Shakespeare seemed willing to follow the direction indicated by his personal clichés, too, reworking again and again, for example, his own version of the family romance, with its rival brothers and fatal, voluminous mothers, so that it took constantly new and different forms.

And the two processes, each with its own methods and concerns, affect each other equally. Creativity is not a matter of dipping a concious problem into a sea of unconscious magic; it is a dialectical process. Art builds on previous art as the painter explores the traditional conventions, partly, indeed, by "regressing in the service of the ego." But it is also built on the artist's courage about himself," as Stokes put it. "The greatest European painters have . . . rediscovered, re-allocated, more and more of themselves in terms of their art: their discoveries have ensued directly from esthetic exploration."[26] In other words, if it makes sense to talk about "regression in the service of the ego" where logical, conventional thought makes its own use of primitive materials, then we can also talk about a progession in the service of the id. Unconscious processes makes use of logic, convention, and conscious problems to achieve their own primitive fantasy goals.

Clearly, art and madness draw on the same aspects of personality—and so do the "peak experiences" of self-realization.[27] To go back to the beginning, the question is not "Are artists mad?" but "How does the artist make the materials of madness into art?"

II

We know surprisingly little about the answer, but we do know that creativity is not just a retreat into the inner world of unconscious material but, rather, a way of combining inner and outer worlds and producing the "new but fitting" result described earlier. All activity, of course, must combine the two worlds, from the most private subjective fantasizing to the most public objective perception and behavior, as well as the artistic activity that lies between subjective and objective worlds. In every case, however, the combination can be managed creatively or uncreatively—there is either a fertile meeting in which imagination informs fact, or a paralysis in which they clash or are frozen into a sterile compromise. Here, psychoanalysis promises to reveal most about creativity, not simply by telling us again that it draws on the inner world cut off from consciousness, but by studying specific cases to see how unconscious thinking meshes with conscious thinking and under what circumstances. To see what psychoanalysis shows about the interaction in creative thought, we should first look briefly at the psychoanalytic theory of thinking in general, and about its origins in infancy, before inner and outer worlds are distinguished—for the child's discovery that the two are separate naturally colors all later efforts to integrate them. In the psychoanalytic account, the child's experience at first is an ambiguous chaos neither conscious nor unconscious, nor felt strictly as fantasy or as perception; it is simply *there*, the whole of experience.[28] His vision of things does not separate thought from feeling, fact from wish: his view of his mother is colored both by who she is and by how he feels, and he doesn't yet know the difference. His thinking may have pseudological form ("If I cry, the bottle will appear"), but is really governed by magical thinking and superstition. It is an intense but fluid world, a sequence of volatile, extreme, and eccentric versions of changing inner and outer states, as yet barely organized in relation to one another. It is an eternal present, sometimes shaped largely by wishes, as in the drive states that Freud studied; other times, shaped simply by the child's primitive cognitive schema at rest, as in the states that Piaget studied—but always very different from the adult's continuous, categorized image of experience.

Gradually the child's experience begins to coalesce around focal points or fantasies determined both by the child's own natural endowment (a particular sensitivity to sound, a physical injury, and so on) and by his unique experiences. Inner and outer work together to form his personal mythology or "identity theme," as Lichtenstein has called it.[29] For example, in the case of one child described by Kris, several circumstances and accidental trauma combined with her own vulnerability to produce a lasting fantasy.[30] The birth of a younger brother had roused her jealousy and stimulated fantasies about killing him, making it hard for her to cope with the guilt she felt about such imagined crimes. While she was still struggling with this conflict, her grandfather died, and within a few months her dog was run over by a car. The complex of wishes, fears, fantasies, and real events was "telescopically" condensed according to imagination's rules into something like a recurring fantasy for her: a scenario in which her emotion kills. "Fantasy" here, though, as usual, is a misleading term, because it is often confused with "daydream," which is a relatively realistic, well-shaped, self-contained story. Unconscious fantasies, by contrast, are really structures rather than final versions of a story. They generate multiple permutations, ringing every change on the central situation, shaped on the one hand by wishes and anxieties, and on the other by an attempt to come to terms with the facts: I hate my little brother; No, I *love* my little brother, but he hates me; I am killing him, so he will kill me; I don't have any feelings at all; I don't have a little brother—it's really a little sister just like me—she *is* me, and I am her; I love *her*.

The dominance of such fluidity and fertility, however, gradually gives way as the child grows up and begins to sort out fantasy from reality, wish from fact. The proliferation of plots and stories is relegated to the internal world and separated off, for most people, from the effort to see the external world as it "really" is and to behave appropriately.[31] The original matrix of favored fantasies or identity themes then continues to multiply primarily in unconscious fantasy, locked away. Though it does leave its mark on the newly independent life, it does so only by having become stabilized into "memories," habits, cognitive schema, and general expectations about the world; it may leave the adult believing, for example, that all emotions are dangerous or that authorities can fix everything, as they could in childhood.

The separation of inner and outer realities is not always easy. If the child's private vision clashes too suddenly and painfully with the facts before he is ready, he may retreat entirely into his fantasies—or else he may seize fetishistically onto the details of the real world, avoiding fantasy altogether, because the difference between the two is too painful and confusing. Either extreme can produce serious mental illness: psychosis in the first case, and a neurotically brittle hold on reality in the second, always vulnerable to repressed fantasies breaking through. For the fantasies banished from consciousness are, of course, never killed. They can come back to preempt other thoughts and take over conscious activities and perceptions, even though they never become conscious in the process—particularly in crises, or "when a person finds himself in a current realistic situation corresponding to an earlier traumatic one," as Klein has described it.[32]

Most people work out some compromise between inner and outer experience in which neither is denied. But most of these compromises are relatively makeshift, allowing little creative interaction between the two. They make peace with troublesome fantasy conflicts by expressing them in some safely confined detail of conscious life. Instead of waking up each morning wanting to kill his father all over again, and struggling through the day thinking about this and trying to act it out, the neurotic finds a more or less acceptable compromise: he kills in his dreams and then becomes a daytime Milquetoast—or he allows himself to be murderous behind the wheel of a car or on the football field. Or he confines the expression of his fantasy to one symptom—Frau Caecilie's facial pain, a delicate stomach, a fear of flying.

The artist's experience is different, and the difference begins in infancy. If we know little else about creativity, we do know that it seems to begin with a happy introduction to reality. For the artist, the distinction between fantasy and reality is an enrichment rather than an impoverishment, an adventure rather than a trial. The young artist is lucky, both in endowment and in his parents. Gifted children seem to be more sensitive: the young artist sees more, is capable of finer discriminations, and responds to patterns as well as to individual things.[33] At the same time, his mother introduces him to reality by degrees, helping him cope with the frustrations of a world not made to his order. He is freed from the ordinary child's dependence on his mother for all his satisfactions, and instead moves toward the range of symbolic substitutes he discovers around him. So begins the child's "love affair with the world," as Greenacre has described it, "which appears to be obligatory in the development of great talent or genius."[34] The child learns that what is out there is potentially gratifying and worth trying for—everything is suffused with the importance and value of the mother. Or, in Winnicott's influential formulation, the good mother provides a "transitional space" between fantasy and reality, in which the child does not have to distinguish between himself and the outside—another version of the love affair in which everything is suffused with the narcissistic importance and value of the self, but a self large enough to include the world.[35] Finally, just as he learns that the world is a good place, the young artist learns that wishing for things and trying to make wishes come true is worthwhile. He learns that his own emotions are also gratifying, like the fantasies associated with them, as these are coming to be defined by contrast to the outer world.

As a result, the gifted child's progress toward mature realistic perception is different from the ordinary child's. For one thing, as he moves out of his childhood experiences, he does not leave them behind so completely. "Genius," said Baudelaire, "is the recovery of childhood at will." It is perhaps more like the "repeated adolescence" [36] that Freud described, in which anything is possible from infantile oblivion to identity crises to mature judgments. Regressive thoughts and ways of thinking are more easily available to the artist—something that common sense and folklore recognize in expecting creativity to incorporate aspects of the primitive. This is one reason why psychological projective tests take the form of a demand to produce rudimentary art works or stories. The Rorschach test is effective, Schafer suggests, because it forces people to be creative and to draw on depths of personality normally shut out of behavior.[37] Artists, not unexpectedly, perform more interestingly, more readily, and more happily than less creative people on such tests, and better artists apparently produce richer and better responses.[38]

But, not only does he keep in touch with childhood experience; the artist is also less likely to lock away his fantasies and to separate the two realms of fantasy and reality. His current fantasy permutations of, and variations on, experience, along with old fantasies from every stage of the past, are more available to consciousness. The artist seems able to avoid the ordinary man's nervous compromises with unconscious conflicts, at least in his work, and he benefits in two ways: he can draw on his unconscious fantasies to enrich his work, and he is free from the defensive postures that stifle creativity even in work where fantasies are not necessarily involved.[39] Some indirect confirmation of all this comes from studies of the creative personality that concur in finding a high tolerance for ambiguity, even a pleasure in ambivalence and anxiety—the very conflicts that lead other people to make neurotic compromises in order not to have to face the continually renewed battle between forces.[40] The artist can live with contradictions, both between himself and the world, and within himself. Artists score high on bisexuality measurements, not necessarily, researchers suggest, because they are more sexually confused than others, but because they are able to recognize discordant aspects of their personality that others must repress.[41]

What is important is not only that artists have access to unconscious material from the past and from current fantasizing, but that they can bring conscious and unconscious together, make fantasy and fact affect each other. The psychotic is deluged with fantasy material, but it neither touches nor is touched by reality. The artist is not only open to his fantasies so that he can express them in real, external forms, but also open enough to reality so that the fantasies can be changed to express it. This is what seems to have happened in the case of Johannes Kepler. His discovery of the laws of planetary motion was driven by his belief in the analogy between Father, Son, and Holy Ghost on one side, and the Sun, the planets, and the intervening space on the other. The analogy itself is hardly surprising in a man of his period, but its intensity and the use he made of it suggest that, as in the case of Frau Caecilie, a cultural cliché here may have carried with it an extra burden of private fantasy that would explain Kepler's fervor. But, unlike the psychotic reported by Anasti and Foley, who used a similar fantasy merely to construct a crazy mechanical cosmos of revolving balls of paper, "to diffuse faith, hope and charity to the world,"[42] Kepler kept trying to make his vision fit the world, and, as Koestler points out, when it did not fit, he changed the vision. The original analogy had required the planets to stand still, like the Son before the Father. In the final analogy, Kepler has quietly made allowance for the "moving" bodies of the planets as revealed by his observations of the sky: "The sun . . . himself at rest and yet the source of motion, carries the image of God the Father and Creator. He distributes his motive force through a medium which contains the moving bodies, even as the Father creates through the Holy Ghost."[43]

Happy beginnings such as the ones just described foster a general creativity and sense of well-being. The second thing we know about what makes the generally creative child turn specifically to *art* is that he is early on driven to channel his love affair with the world into the realm of one particular medium. Whatever the reason, the affair with the world at large, and especially with other people, fails. And, just as in infancy the artist was freed from depending only on his mother, in this later stage the artist frees himself from depending on other people and seems to find all his company in his art. People, however, are still important in this development, just as his mother was important earlier, for the child's choice of a medium depends both on endowment and the human environment. He chooses math (or writing or painting) partly because he has some skill in it, but also because he has been introduced to it by someone important to him, real or imagined. In his study of gifted adolescents, Kris went so far as to say that he had never seen a case of artistic talent that had *not* begun by identifying with an older person, though often at a second or third remove, like a grandfather or a figure in family legend.[44] Even in asserting his independence from people, the child uses the forms of dependence—but on imaginary people, or on ones easier to deal with, like the younger siblings who were the first audience for Lewis Carroll's witty narratives, Edward Lear's nonsense, and the Brontë's stories.

Art, then, is not an escape from, but an alternative version of, human relationships, and usually what drives the child to such alternatives is pain, loss, and suffering. Children turn to art when their parents die or are otherwise unavailable; one study of one thousand writers showed that nearly all of them had lost a parent in childhood. They turn to art when their own sense of themselves fails them too. The failure can take the form of physical suffering or disability, which, however slight in itself, can become nightmarish to a child's primitive view. Lombrosco's famous study published in 1895, *The Man of Genius*, argues for a connection not only between genius and madness but between genius and physical degeneracy as well.[45] He cites the historical evidence: famous men who were remarkably short (Aristotle, Plato, Blake); who suffered from rickets, hunchback, clubfoot, or lameness (Brunelleschi, Pope, Talleyrand, Byron); who were pale, emaciated, weak, and sickly. Many of these "failings," of course, would now be seen as the psychosomatic symptoms of conflict about genius rather than as sources for it; but Niederland in a more recent study has analyzed eight artists who were born with physical defects or suffered early wounds, and he found that the mental image of his disease played a large part in shaping both the artist's ambition and the details of his work.[46] Deutsch suggests that the three sculptors he studied had all turned to the mode of touching and kneading when another sense began to fail. Rodin, for example, could barely see, but before his nearsightedness became evident as the source of his difficulties in early childhood, he had been rejected as simply odd. He then gradually withdrew from people, and was always touching and molding what he *could* see—first little bits of bread, then his clay.[47] In all these cases, the real loss matters less than the child's imagined version of it. Sometimes the loss that drives a child into his art is almost wholly imagined—a fear of his own rage and destructiveness, for example, that can be rendered harmless when practiced on painted figures.

This is not to say that everyone who loses a parent or suffers a body wound in childhood will become an artist (the studies seldom sample one thousand ordinary people to see how many of them had lost parents early). But loss may well turn out to be a necessary, if not sufficient, condition, just as a certain level of intelligence is necessary but not sufficient in determining creativity.[48] What matters is that the artistic child is unusually sensitive to both inner and outer conflict, that he is more aware of its unconscious elaborations in fantasies, and that he turns to his art to work out the fantasies. The art at first matters to the child primarily for its role in the recurring cycle of rising conflict and resolution; it makes the child's sanity, perhaps even his existence, possible, to judge from autobiographical accounts.

What then becomes important to him as an *artist*, however, is that the cycles do not merely repeat themselves. Each time the child puts such energy into his drawing or mathematical games, he improves, and the talent becomes independent of the conflicts that drive him to it. At first, the relation between conflict and art is simple and direct: art is therapy. The little girl of two-and-a-half who paints an astonishingly effective mask one day in November is working out a frightening Halloween experience.[49] Often, the talent is restricted in fact to a particular subject matter: to horses seen in a book given to her by her father, or women's faces. Similarly, at first the movement toward art has a simple and direct role in the child's emotional life: it replaces some other relation. Picasso, for example, was clearly identifying with his painter-father who made such impressive pictures of "thousands and millions" of pigeons, as Picasso later described it. He himself used to draw dead pigeons, feather by feather in his father's academic style, waiting for criticism. But later the art becomes independent of the conflicts that generated it, and so does the artist. The little girl goes on to paint other things. And Picasso goes on to paint in ways different from his father: fifty years after his apprenticeship he drew the wildly unacademic pigeon of peace, the white dove that now he could see reproduced in "thousands and millions" of posters.[50] If the art does not become independent, the child is not an artist; conflict is not enough to generate creativity. But if he is an artist, he may never discover his talent without the motive that loss supplies.

Once the artist's talent becomes independent of the conflicts that generated it, is there any role left for the unconscious realm that the psychoanalyst studies? What place has it in the adult life of a mature artist? In tracing the psychoanalytic view of creativity, we have looked first at the artist's infantile love affair with the world, which separates him from less creative people; then we looked at the early channeling of this affair into a love for his medium, which separates the artist from other creative people. Let us now examine something that separates the artist from himself—that separates the successful acts of creation from all those others that every artist knows. A story is told about an art dealer who came to Picasso to check the authenticity of one of the artist's paintings. "It's a fake," said Picasso. After several more unsuccessful tries the dealer returned with yet another "Picasso." "It's a fake," said the painter. "But I saw you paint this one with my own eyes!" the dealer replied. "I paint many fakes," said Picasso.[51] What separates the real thing from the fakes? Which failures (of honesty? patience? courage? imagination?) block the artist once his talent is established? The difference between Picasso's drawings and mine may not be unrelated after all to the difference between real and fake Picassos. The artist's creativity emerges from his primitive love affair with his medium. What we have been looking at so far (the difference between Picasso and me) emerges from the childhood origins and vicissitudes of this affair; what we now turn to emerges from its fluctuations as it continues in adult life.

What characterizes the artist is that his love affair *does* continue, in all its primitive intensity. It generates his art, and its problems generate his blocks. The first sign of this is simply the artist's intensity about his work. Not all driven people are artists, but we expect the artist to be passionate; he is "married to his work."[52] The second thing we notice is that "marriage" includes primitive sorts of relation, not only the literal one that Freud implied when he said that Leonardo's research replaced part of his sex life. The psychoanalytic theory does not imply that adult sexual activity and art are mutually exclusive. Art replaces *childhood* love life, in all its childish forms.

The most important implication of this, as we have seen, is that the artistic activity is like a human relationship rather than an escape into the solitary realms of fantasy—or into mere instinctual discharge, as psychoanalysts first saw art. The artist may be driven, obsessed; but he is driven to be objective and obsessed with the realities of his medium. The madman is merely obsessed; the artist's madness takes the form of staying in touch with his reality, or rather with the part of reality he has chosen as his medium. He stays in touch because he is in love with it. "I cherish the human physiognomy," the painter says, and Keats "looks upon fine phrases like a lover." The artist has, as Darwin did, an eye for the exceptional detail and a fascination with it, a need to account for it. If genius, as Carlyle said in his iconoclastic definition, is first of all a transcendent capacity for taking trouble, then the artist's passion drives him to take trouble. He has to do it right: "If I am not clear then the whole world collapses around me," as Stendahl put it.

The romantic notion is that the artist takes the world up into his mind and subdues everything outside to his private vision. But if Keats said at one point, "The Sun, the Moon, the Earth and its contents, are material to form greater things than the Creator himself made," he also said in an even more famous passage that the poet has no character—he does not make but *becomes* things. He retreats into a billiard ball, becomes a sparrow. The mutualities implied by a relationship find expression in the sense of play that is often described in the artist's work. He continues a childlike play at accommodation to the world (and, childlike, this may include some tantrums)—constantly trying out ideas, making journals and lists of possible stories, being driven by the need to touch things, the irresistible urge to pick up a brush, sketch a cloud formation, write it down. He shapes the work; but the shape it takes at one stage in turn shapes his reaction as he moves to the next. Characters in novels rebel and force authors into new plots; an accidental splatter changes the balance of a design. The creative "act" is really a creative process, a fearless exchange between inner and outer realities.

The final and most interesting implication of the artist's adult love affair with the world is the fact that, like all affairs, it generates fantasies and draws on the depths of the unconscious personality; after all, the remnants of childhood love survive only in fantasy, and these remnants are what are acted out during the act of creation. But I do not mean only those fantasies expressed *in* the work of art. Interesting as it may be to follow these, they may often show us more about how the artist is just like the rest of us than about his uniqueness. As Kris put it in rejecting the kind of criticism that studies fantasy content only, they may simply show that " 'he too,' whoever he was, was torn by love and hate, ridden by complexes and unconsciously directed by them."[53] But Kris went on to suggest an entirely different approach when he asked what fantasies the artist had *about* the painting and about the act of painting it. This may be the most interesting question analysts have asked since Freud first started wondering about the role of fantasies.

That there are such fantasies we know, even from their collective, public versions. The myth of the artist as transgressor, described earlier, is one of these; and there is a more modest form of it, which passes itself off as history, in the early biographies that naively retell the same anecdotes for each artist: that he was an untutored peasant, that one day a great artist accidentally discovered him sketching brilliant figures in the sand and adopted him.[54] Even more revealing than the collective fantasies—which no doubt artists share with everyone else—are the private fantasies that invest with significance each artist's moments of exhilarating inspiration or his rhythms of labor.

One of the best ways of studying these is to examine the artist's working habits and requirements. Creativity seldom comes easily, and if it does, it seldom lasts long. Most creative artists have developed ways of inducing it themselves by little rituals of preparation. In the psychoanalyst's view, these are the scene and setting for unconscious fantasies about the creative act, although from the outside they may seem like random, meaningless habits or at worst, harmless, bizarre quirks. The writer has his own special pen or pencil and his own requirements for paper; the artist has his way of laying out paint. Even the peripheral details matter: Schiller had to smell rotting apples, Kant had to lie in bed with the sheets and covers arranged a certain way, Auden had to drink cups of hot tea,[55] and one scientist reported in his analysis that he had to shut himself up in a room without any noise, with very little light, and with as little other stimulation as physically possible. He could not even tolerate lines on the paper he used; it had to be pure white.[56]

Such requirements, says Spender, dismissing their importance, are no more than arbitrary aids to concentration.[57] But in cases where analysts have been able to collect more evidence about the private meaning of such rituals, they seem no more random than the fetishistic shoe or black garters that other men require for their acts of love. The fetishistic quality is easiest to accept in the more disturbed creators, like those, for example, who have to go so far as to disown their own name and identity when they write. Chatterton had to pose as a medieval monk before he could write decent poetry. Charles Dodgson was a failure not only as a writer but also in his chosen field of mathematics—only as Lewis Carroll could he create brilliant works of fantasy. And one scientist, Kris reports, had to go through the motions of consulting a colleague each time he was working on a problem, in order to "learn" from the colleague exactly what he himself had explained in the consultation, so that he need not take the responsibility of being creative.[58] Some poets have to fall in love to write. Goethe's infatuations corresponded more closely to the demands of his own creative cycles, Kretschmer suggests, than to the nature of the women, and, in fact, if one woman disappointed him while the creative spell lasted, he found another to carry him through until it was over.[59] In any case, the artists who invoke a fictional muse are indulging in fantasies that may well have unconscious components. Certainly, the analytic studies of writing blocks often reveal fantasies either about destroying a fragile audience or about being destroyed by a hostile one.

Psychoanalysts have invoked every period of childhood development in seeking the origin of these fantasies. Bergler said that every writer is trying to rebel against his mother by himself creating the infant's oceanic merger with the world when he merges with his own story.[60] The English analysts, by contrast, see the artist as trying to restore the mother and the world he feels he has destroyed by his own infantile rage at frustration.[61] A range of doings and undoings apart from these have also been suggested,[62] but in general they fall into two categories: fantasies about the transgressor and about the transgressed. The first includes the heroic myths of creators mentioned before, as well as their oral stage counterparts, in which the artist swallows up the outside world. Perhaps its most familiar versions though, are the ones Freud singled out, the Oedipal-stage fantasies about making things in order to triumph over the father and win the mother by impressing her.[63] The literary critic Harold Bloom has recently argued that every important poet acts out a more relevant Oedipal rebellion against a *poetic* father, whose poem he admires, by rewriting, distorting, and wrenching the words away from the original.[64] Clinical evidence indicates that such fantasies are common; making things does make people feel as if they were killing or stealing from their fathers, and the fantasies have their effect. The fantasied crime may successfully excite one artist to his best performance, but more often the potentially energizing fantasy paralyzes the artist into a defensive reaction. One young man with a stubborn writer's block, for example, knew only that he was afraid to write because he was afraid he would plagiarize without knowing it. Analysis revealed fantasies about cannibalizing his father, a primitive version of plagiary, at first betrayed only by the young man's "predilection for eating brains"; no wonder he was afraid to write.[65] In fantasy, at least, much can go on in the artist's mind that makes it appropriate, as Thomas Mann put it, that he "approach his work in the same frame of mind in which the criminal commits his crime."

The second group of fantasies tells a contradictory story. These are usually "inspiration" fantasies in which transgression comes from the other side as a force greater than the artist overwhelms him, and he is "penetrated" by insight, as Nietzsche put it. The force may be divine or mundane (in a famous description A. E. Housman attributes it to the effects of a beer and a good meal) or even a matter of lucky chance—an apple falling or a Petri dish left untended. Although theorists trying to systematize these fantasies may be bothered by the contradiction, it makes good sense, first, that different phases of creativity may generate different fantasies and, second, that the creative act may alternately generate masculine and feminine, active and passive fantasies, in which sometimes the world and sometimes the artist is annihilated. If creating something involves a passion for fit and a need to merge inner and outer worlds, it also means the destruction of each of these worlds as a separate entity. Every work of art is both creative and destructive; it destroys the object if only by simplifying and stylizing it, but it also recreates.

There is still the question of whether fantasies about the creative process have anything to do with the actual content and shape of the thing created; after all, the artist presumably has the same fantasies, or very similar ones, no matter what he is creating. But in the conscious realm, at least, we are beginning to understand how important is the artist's self-consciousness about the creative act, and to appreciate how often painting is about painting, writing about writing, and, most recently, criticism is an interpretation of the critical act. We know much less about the role of unconscious fantasies accompanying this self-consciousness, but the clinical evidence suggests that fantasies about the work may be just as important.

More research needs to be done. But if it seems strange to look to these apparently peripheral fantasies accompanying creativity and find in them something more essential, there is a model in psychoanalysis itself for doing so: the analysis of "transference," or the patient's fantasies about the analyst and about the process of psychoanalysis. The whole cure in psychoanalysis comes about through the analysis of transference. Freud, however, did not start out by analyzing transference—quite the opposite—and his shift may be a good example to follow in thinking about the creative process.

When Freud first started practicing his "talking cure," all he wanted to do was to bring back his patient's repressed memory from the unconscious. He did not care what the patient thought about this process, let alone what fantasies he had about it, and in fact preferred hypnotizing him into compliance. But it soon became clear that a passively induced and isolated illumination was not enough to cure anyone, at least not for long. The patient had to confront his resistance to the memory and to understand the nature of the resistance itself and what fantasies it involved. Only by working through all this was anything really changed. "We used to try to give the patient back his repressed memories," Giovacchini has said, "but now we try to show him how his mind works"[66]—showing him this, we might add, by showing him how he thinks about the process. The fantasies that seemed like peripheral distractions turn out to be the necessary focus of the psychoanalytic process. The same reorientation may well turn out to be necessary in understanding the creative processes; the artist's fantasies about what he does may be as central as his materials and skill. Perhaps creativity, at least once it has been developed in childhood, is not so much a transgressing of limits as a need to *believe* that one is transgressing limits and striving for the impossible. "For an artist," Giacometti said, "to succeed is to fail."

The artist is different, then, not because he has been given a mysterious more-than-human energy and talent, but because he has channeled his human energies and talents into his art—as a child, which gave him his skill, and as an adult, which gives him his energy. Insofar as he is an artist (and no artist is always an artist), what makes him different is that his art is his world, and his work is his love life; it is an end in itself, accompanied by its own fantasies, for no other audience except the fantasied one in his own mind.

Again, the outlines of these conclusions are already implied by the Daedalus story—as a comparison with a most unartistic hero, Theseus, will show, though Theseus was also a treader of labyrinths. Daedalus made the labyrinth; Theseus set out to undo it. Daedalus was trying to make a place in which the Minotaur could live; Theseus set out either to kill the Minotaur or be killed by it. Daedalus was in touch with life outside the human boundaries and tried to give it a place in the kingdom; but Theseus clashed head on with something so alien, and could not exist in the same world with it. Finally, everything Daedalus did was done for its own sake and not for a personal reward; it was the bull, not Daedalus himself, who enjoyed Pasiphae, and it was Pasiphae's child, the Minotaur, who was saved in the labyrinth. But Theseus went into the labyrinth with the help of Pasiphae's daughter, Ariadne, and won Ariadne as a reward when he came out. Daedalus's efforts were their own ends; *lieben* and *arbeiten*, love and work, were identical. Theseus's efforts were a means to the more normal human end of winning a love aboveground, in the outside world.

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[1]See, for example, Albert Rothenberg, *The Emerging Goddess: The Creative Process in Art, Science, and Other Fields* (Chicago: University of Chicago Press, 1979).

[2]See summaries of attempted definitions in *The Creativity Question*, Albert Rothenberg and Carl Hausman (eds.) (Durham, N.C.: Duke University Press, 1976), pp. 3-26; and Barbara Forisha, "Mental Imagery and Creativity: Review and Speculations," *Journal of Mental Imagery*, 2 (1978): 212-3.

[3]Ernst Schachtel, "Memory and Childhood Amnesia," in *Metamorphosis* (New York: Basic Books, 1959), p. 288.

[4]Arthus Koestler, *The Act of Creation* (New York: Macmillan, 1964), p. 96.

[5]Monroe Beardsley, "On the Creation of Art," *Journal of Aesthetics and Art Criticism*, 23 (1965): 391-404.

[6]Koestler, *The Act of Creation*, pp. 35f.

[7]Wolfgang Kohler, *The Mentality of Apes* (1918; reprinted, London: Pelican Books, 1957).

[8]Ernst Gombrich, "Meditations on a Hobby Horse, or the Roots of Artistic Form," in *Aspects of Form, A Symposium on Form in Nature and Art*, L. L. Whyte (ed.) (New York: Pellegrini & Cutahy, 1951), pp. 209-28.

[9]First described in Graham Wallas's classic study *The Art of Thought* (New York: Harcourt Brace, 1926).

[10]Jacques Barzun, review of Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind* (Boston: Houghton Mifflin, 1978), in *TLS*, 3972 (May 19, 1978): 559-60.

[11]Jaynes, *The Origin of Consciousness.*

[12]Kekulé's dream has become part of the creativity folklore and is cited in nearly every study of creativity I have seen. The original account of the dream appears only in Kekulé's address to the German Chemical Society in 1890. The most frequently cited passages were translated by F. R. Japp in his Kekulé Memorial Lecture in 1897, *Journal of the Chemical Society*, 73 (1898): 97-138.

[13]Claudia Morrisson, *Freud and the Critic: The Early Use of Depth Psychology in Literary Criticism* (Chapel Hill, N.C.: University of North Carolina Press, 1968), pp. 3-36.

[14]Joe Khatena, "Creative Imagination Imagery," *Journal of Mental Imagery*, 2 (1978): 34.

[15]Donald McKinnon, "The Personality Correlates of Creativity: A Study of American Architects," Proceedings of the XIV International Congress of Applied Psychology, vol. 2, G. S. Nielsen (ed.) (Copenhagen: Munksgaard, 1962), pp. 11-39. The data presented in such studies are extremely difficult to interpret, depending as they do on the researcher's definitions (how do you define the "creative person" before testing his personality attributes—by the number of things he has produced? by their quality? by other personality attributes?) and on his techniques. Moreover, the number of people carrying out such research is relatively small, so that creativity studies referring to the "facts" about artists are actually drawing on material gathered by only about three researchers.

[16]Stanley Edgar Hyman, *The Armed Vision: A Study in the Methods of Modern Literary Criticism*

(1948; reprinted, New York: Vintage Books, 1955).

[17] Ernst Kris, especially, "On Preconscious Mental Processes," but also other essays collected in *Psychoanalytic Explorations in Art* [1932-1952], (New York: International Universities Press, 1952).

[18] The related Freudian concept of *sublimation* (the artistic use of instincts that would otherwise be repressed or distorted into symptoms), is similarly tautological and has been recently questioned. Freud, in other words, postulated a process that was supposed to *explain* how these instincts were transformed into art, but it turns out that the term simply *acknowledges* the fact that the instincts do get so transformed. See, for example, Joseph Sandler and W. G. Joffee, "On Skill and Sublimation," *Journal of the American Psychoanalytic Association*, 14 (1966): 335-55.

[19] Lawrence Kubie, *Neurotic Distortion of the Creative Process* ([1958]; reprinted, New York: Farrar, Straus & Giroux, 1971), p. 143.

[20] Sigmund Freud, "Fraulein Elisbeth von R.," *Studies on Hysteria (1893-95)*, *Standard Edition of the Complete Works of Sigmund Freud*, vol. 2, pp. 176-9.

[21] Marshall Bush, "Psychoanalysis and Scientific Creativity," *Journal of the American Psychoanalytic Association*, 17 (1969): 170.

[22] " 'Alice' on the Stage," Art in *The Theater* 9 New Series (1887), pp. 180-1. Cited in Rosamond Harding, *An Anatomy of Inspiration* (Cambridge, England: W. Heffer & Sons, 1948).

[23] Facts about Kekulé's life are taken from Richard Anschütz, *August Kekulé* In 2 Bänden (Berlin W10: Verlag Cheme, G.M.B.H., 1929).

[24] Adrian Stokes, *Painting and the Inner World* (London: Tavistock Publications, 1963), p. 6.

[25] Emrys Jones, *The Origins of Shakespeare* (Oxford: Clarendon Press, 1977), pp. 1-30.

[26] Stokes, *Painting and the Inner World*, p. 7.

[27] Abraham Maslow's term; see his *Religions, Values and Peak-Experiences* (Columbus, Ohio: Ohio State University Press, 1964).

[28] For an excellent general account of the psychoanalytic theory of development and its beginnings in a global, undifferentiated experience, see Heinz Werner and Bernard Kaplan, *Symbol Formation: An Organismic-Developmental Approach to Language and the Expression of Thought* (New York: Wiley, 1963); or Hans Loewald, *Psychoanalysis and the History of the Individual* (New Haven, Conn.: Yale University Press, 1978).

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[30] Ernst Kris, "The Recovery of Childhood Memories in Psychoanalysis," *The Psychoanalytic Study of the Child*, 11 (1956): 54-88.

[31] For a classic psychoanalytic account of the development of a sense of reality and the recognition of fantasy as such, see Marion Milner, "Some Aspects of Phantasy in Relation to General Psychology," *The International Journal of Psychoanalysis*, 26 (1945): 143-52.

[32] George Klein, *Perception, Motives and Personality* (New York: Knopf, 1970), p. 398.

[33] Phyllis Greenacre, "The Childhood of the Artist: Libidinal Phase Development and Giftedness" (1957), in *Emotional Growth: Psychoanalytic Studies of the Gifted and a Great Variety of other Individuals*, 2 vols. (New York: International Universities Press, 1971), 2, pp. 479-504. See also Josephine Arasteh, "Creativity and Related Processes in the Young Child: A Review of the Literature," *The Journal of Genetic Psychology*, 112 (1968): 77-108.

[34] Greenacre, "Childhood of the Artist," p. 490.

[35] D. W. Winnicott, "Transitional Objects and Transitional Phenomena," *International Journal of Psychoanalysis*, 34 (1953).

[36] "Mentioned more than once in Freud's letters" and "ascribed to himself as well as to his friend Willhelm Fliess." Erik Erikson in "The Dream Specimen of Psychoanalysis," *Journal of the American Psychoanalytic Association*, 2 (1954): 54.

[37] Roy Schafer, *Projective Testing and Psychoanalysis* (New York: International Universities Press, 1967), pp. 99f.

[38] S. Z. Dudek, "Regression and Creativity: A Comparison of the Rorschach Records of Successful vs. Unsuccessful Painters and Writers," *The Journal of Nervous and Mental Disease*, 147 (1968): 535-46; Robert Holt, "Artistic Creativity and Rorschach Measures of Adaptive Regression," in *Developments in the Rorschach Technique III*, Bruno Klopfer, Mortimer Meyer, and Florence Brawer (eds.) (New York: Harcourt Brace Jovanovich, 1970), pp. 263-320.

[39] Bush, "Psychoanalysis and Scientific Creativity," pp. 184-5.

[40] Ernst Kris had noted the artist's "libidinization of anxiety," that is, his pleasure in the normally unpleasant disruptions, contradictions, and complexities that might be expected to cause anxiety. Kris's phrase is cited in Leopold Bellak, "Creativity: Some Random Notes to a Systematic Consideration," *The Journal of Projective Techniques*, 22 (1958): 376. Indirect measures of the preference for complexity and contradiction are reported by, for example, Frank Barron, "The Needs for Order

and Disorder as Motives in Creative Activity," in *Scientific Creativity: Its Recognition and Development*, C. W. Taylor and Frank Barron (eds.) (New York: Wiley, 1963) pp. 153-60.

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[52] As described by Joseph Sandler and W. G. Joffee in "On Skill and Sublimation," p. 348.

[53] Ernst Kris, "A Psychotic Sculptor of the Eighteenth Century," in *Psychoanalytic Explorations in Art*, pp. 128, 143; "On Inspiration," *Psychoanalytic Explorations in Art*, pp. 289-302.

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[56] John Gedo, "On the Psychology of Genius," *International Journal of Psychoanalysis*, 53 (1972): 200.

[57] Stephen Spender, "The Making of a Poem," in Ghiselin, *The Creative Process*, pp. 14f.

[58] Kris, "On Inspiration," p. 299. See similar cases in, for example, Victor Rosen, "On Mathematical 'Illumination' and the Mathematical Thought Process," *The Psychoanalytic Study of the Child*, 8 (1953): 127-54.

[59] Ernst Kretschmer, "He only fell in love at given times." *The Psychology of Men of Genius* (New York: Harcourt Brace, 1931), p. 113.

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[61] See, for example, Melanie Klein, "Infantile Anxiety Situations Reflected in a Work of Art and in the Creative Impulse" (1929), in *The Creative Imagination: Psychoanalysis and The Genius of Inspiration*, Hendrik Ruitenbeck (ed.) (Chicago: Quadrangle Books, 1965), pp. 55-66; H. B. Lee, "A Theory Concerning Free Creation in the Inventive Arts," *Psychiatry*, 3 (1940): 283-92; Ella Sharpe, "Similar and Divergent Unconscious Determinants underlying the Sublimations of Pure Art and Pure Science," *The International Journal of Psychoanalysis*, 16 (1935):186-202.

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[64] Harold Bloom. The argument was first formulated in *The Anxiety of Influence* (New York: Oxford University Press, 1973).

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STANLEY CAVELL

Knowledge as Transgression:
Mostly a Reading of *It Happened One Night*

For the discussion among the symposiasts of the original version of the following essay, I introduced what I had to say by expressing an awareness of a certain outrageousness in considering, and in asking others to consider, a Hollywood film in the light of the teaching of what has claim to be regarded as the most serious philosophical achievement of the modern age. In part I meant to be contributing to a discussion of limits and their transgressions, an essay that itself embodied a little transgression in its indecorous juxtaposition of subjects. (But you might think that velvet.) I was compelled in any case to include a statement of Kant's teaching both to call to attention the fact that this epochal achievement can be described as exactly a discovery of and about limits and transgressions, and because I felt that Kant's investigation of the idea of human limitations anticipated an ambiguity in the idea (say, as between picturing these limitations as confinements of knowledge and as conditions of knowledge, as made to defeat or to define the human in knowledge and conduct) that was bound to arise repeatedly in our discussions, and that would be unresolvable apart from work as strenuous as Kant's. This feeling seems to me to have been borne out in the event.

I gave three principal reasons for *my* transgression, that is, for courting and expressing a certain outrage. Various participants found them useful in thinking over what I had written and urged me to include a statement of them with my essay.

First, I wished to take the opportunity to acknowledge that philosophy, as I understand it, is indeed outrageous, inherently so. It seeks to disquiet the foundations of our lives and to offer us instead nothing better than itself—and this on the basis of no expert knowledge, of nothing closed to the ordinary human being, once, that is to say, that being lets himself or herself be informed by the process and the ambition of philosophy. Wittgenstein voices the accusation against his work that it "seems to destroy everything interesting, that is, all that is great and important." He replies, as translated, that what he is "destroying is nothing but houses of cards"—as if this destruction were less important, less devastating than some other, as if we had any other modes of dwelling.[1]

Second, I wished to take the opportunity of the form of symposium to raise a question of the limits of the convivial, anyway of the extent to which the experiences and the pleasures of the symposiasts were shareable—a way of testing the limits or the density of what we may call our common cultural inheritance. This issue was focussed for me by the request of several of the symposiasts for a thumbnail sketch of Kant's views against which one unfamiliar with Kant might assess my claims about him in my opening pages. (And to assess echoes in the closing?) Since my pages on Kant are already a thumbnail sketch, I assume what was meant was a preceding sketch, maybe like a short encyclopedia entry. Whatever the value in such a genre, for my purposes it would have none. It would not, for example, put its recipient in a position to assess certain originalities in the way I sketched Kant's vision. (But you might think this some more velvet, or maybe burlap.) A purpose of mine, in any case, was precisely to bring into question the issue of our common cultural inheritance. The request for a (another) thumbnail sketch is an expression of something my sketch, in its juxtaposition with a Hollywood film, itself registers, that Kant is not a part of the common cultural inheritance of American intellectuals. (Perhaps this just means that we are not Germans or Central Europeans.) But if one of the indisputably most important philosophical achievements of the modern era of Western Civilization is not a piece of our inheritance, what is? The ensuing discussion of a Hollywood film might stand in the place of an answer, or as a certain emblem of an answer. It must be an ambiguous place. One ought not to say, for example, that we have films instead of books as our legacy. In the first place, we do have some books (though perhaps not many we share with outsiders); in the second, it is not clear that we do have films in common, or not clear what it is to "have" them; in the third, the idea of "instead of" is undefined. The fact is that you cannot acquire the Kant I know from me, certainly not here and now. Anyway, would this work be worthwhile just for the sake of having something intellectual in common? Whereas a companion fact is that you can acquire from me, or reacquire, a Hollywood film, here and now (if you've seen it recently), along with certain related matters. But would this be something worthwhile having in common?

My juxtaposition of Kant and Capra is meant to suggest that you cannot know the answer to the question of worthwhileness in advance of your own experience, not the worthwhileness of Capra *and* not that of Kant. (Some might feel this means that nothing we stand to inherit is sacred, and further that this just means we are Americans.) I am not, in the case of the Capra, simply counting on our capacity for bringing our wild intelligence to bear on just about anything, say our capacities for exploring or improvisation. What we are to see is the intelligence that a film has *already* brought to bear in its making; and hence perhaps we will think about what improvisation is and about what importance is.

Perhaps we will not, too; which means that my transgressing conjunction of interests will be refused as a courting, and expression, of the outrageous. This would tend to outrage me (because it would strike me as intellectually complacent and neglectful)—to acknowledge which is the third reason for my conjunction here of film and philosophy.

To subject these enterprises and their conjunction to our experience of them—that is, to assess our relation to these enterprises—is a conceptual as much as it is an experiential undertaking; it is a commitment to being guided by our experience but not dictated to by it. I think of this as trusting one's experience. I indicated a moment ago in my quotation from Wittgenstein that philosophy requires the sense or the title of all that is great and important to be given up to experience. If one may think of this as an overcoming of philosophical theory, I should like to stress that the way to overcome theory correctly, philosophically, is to let the object or the work of your interest teach you how to consider it. I would not object to calling this a piece of theoretical advice, as long as it is also called a piece of practical advice. Philosophers will naturally assume that it is one thing, and quite clear how, to let a philosophical work teach you how to consider it, and another thing, and quite obscure how or why, to let a film teach you this. I believe these are not such different things, but my essay attempts to make it out mostly in the case of a film.

One feature of the essay sets up an appeal to one's experience, or to an active memory of one's experience, more continuous than any of my other pieces of writing about film—I mean its frequent transcription of dialogue.[2] Apart from a clear memory, or a vivid imagination, of these words as spoken by these actors in those settings, my attention to these words may well seem misplaced or overdone. But this is an epitome of the nature of conversation about film generally, that those who are experiencing again, and expressing, moments of a film are at any time likely to become incomprehensible (in some specific mode, perhaps as enthusiastic to the point of folly) to those who are not experiencing them (again). I am regarding the necessity of this risk in conversing about film as revelatory of the conversation within film—at any rate, within the kind of film under attention here—that words that on one viewing pass without notice, as unnoticeably trivial, on another resonate and declare their implication in a network of significance. These film words thus declare their mimesis of ordinary words, words in daily conversation. A mastery of film writing and film making accordingly requires, for such films, a mastery of this mode of mimesis.[3]

Trusting one's experience is a rubric an American, or a spiritual American, might give to the empiricism practiced by Emerson and by Thoreau. The moral we might draw from their practice is to educate your experience sufficiently so that it is worthy of trust. The philosophical catch would then be that the education cannot be achieved in advance of the trusting. Hence, Emerson is logically forced to give his best to Whim. Yet, the American inheritance of Kant (and wasn't this in advance of experience?) is essential to making up Transcendentalism, and hence it goes into what makes Emerson Emerson and what makes Thoreau Thoreau.

* * *

If it is inevitable that the human conceive itself in opposition to God; and as debarred from a knowledge of the world as it is in itself; and as chained away, incomprehensibly, maddeningly, from the possibility of a happy world, a peaceable kingdom; then it is inevitable that the human conceive itself as limited. But what is it to conceive this? Let us say it is to take ourselves as finite. Would this be something positive or something negative, something lacking? In either case, it portrays being human as being inherently subject to the fate of transgression, to commandments and prohibitions that are to be obeyed and that therefore *can* be disobeyed.

I have recently published a book in which philosophical skepticism is cast as a wish to transgress the naturalness of human speech. But skepticism is also described as a peculiarly human prerogative. My subject here shifts the wish to transgression from what might be called the natural to the social plane. Two of the fundamental human properties that human societies have been most anxious to limit are the capacity to relate oneself to the world by knowledge and the capacity to relate oneself to others by marriage. We seem to understand these capacities for relation as constitutive of what we understand by human society, since we attribute to them, if unchecked, the power to destroy the social realm.

If we do not equate human knowledge with the results of science but understand it as the capacity to put one's experience and the world into words, to use language, then the will to knowledge and the will to marriage may be seen to require analogous limitations in order to perform their work of social constitution, limitations that combat their tendencies to privacy or their fantasies of privacy. Concerning marriage, I am invoking Lévi-Strauss's understanding of the barrier to incest as the force necessary to compel that reciprocity and exchange apart from which separate human families cannot create the realm of the social, the public. I shall not claim that this understanding is as clear as one would like, and especially not that it is, as it seems to take itself to be, an alternative to Freud's psychological account. In particular, if there is a *horror* of incest, I do not see that Lévi-Strauss's compulsion to society reaches it. My intuition is merely that any better view of these matters, and of their connection, will have to take up this one. Concerning knowledge or language or naming, I am invoking Wittgenstein's construction and destruction of the possibility of a private language as revealing the barrier to narcissism, facing us with that reciprocity and exchange apart from which separate human individuals cannot acquire the force so much as to name themselves, to create the realm of the private.

This region of issues may seem as abstract and distant from our everyday experience as any theories of anthropology and of philosophy, but they are as close to us as what I have recently claimed to be a genre comprising the best of the Hollywood comedies since the advent of the talkie[4]—or so I will try to show by spending most of my time here reading the earliest of those comedies, Frank Capra's *It Happened One Night.* Before turning to that film, I wish to map out a little the abstractness and the apparent distance of the idea of our lives as shaped by certain reigning intellectual and social barriers. I wish to call to mind certain pictures of the human projects of knowledge and of community blocked out most memorably in Kant's philosophizing, for Kant is the first figure likely to occur to a philosopher who has been asked to think about the subject of limits in human knowing.

The empiricists Locke and Hume also insist upon something each *felt* as limitations of reason. Locke's introduction to his *Essay Concerning Human Understanding* explains the motive for his investigation as one of determining, before any particular investigations of nature, or of God, what we can hope to know, what we are humanly equipped to know, to save ourselves fruitless ventures into matters exceeding the limits of our understanding. And in the *Dialogues Concerning Natural Religion*, Hume, through Philo, speaks of our understanding or experience as limited in extent and duration. Both recommend a modesty, or humility, in the exercise of our powers of understanding, suggesting a prudent limitation of our aspirations that will accord better with these powers. But both Locke and Hume rather suggest that if our powers of understanding were enlarged, we would be in a position to know what we cannot at present know. What Kant undertakes to show is that our present position is in a way worse than that suggests and in a way better than that suggests. It is worse because, although, of course, with "increased" range of experience and greater powers of understanding (and it is important that it is quite unclear what this would mean—new sensations? new concepts? new laws?) we would know *something* more than we know now, we would still never know enough, or not the right sort of thing, to satisfy the philosopher's dream of perfect knowledge. Philo had said that "our experience, so limited in extent and duration, can never provide us with a significant conjecture concerning the whole of things." It is as if Kant were saying, "This formulation puts our problem wrongly from the beginning, it is a false picture of the faculty of knowledge altogether." For "the whole of things" *cannot* be known by human creatures, not because we are limited in the extent of our experience, but, as we might say, because we are limited *to* experience, however extensive. Put it this way: to know the world as a whole, or the world as it is in itself, would require us to have God's knowledge, to know the world the way we more or less picture God to know the world, with every event and all its possibilities directly present. And this simultaneous, immediate intuition of the world is not merely beyond us in fact or in extent; it is not a matter of having more of something we now have a little of. It is beyond us in principle; human knowledge is not like that. First, because all our knowledge, being a function of experience, is *sequential;* it takes place in time (in history, Hegel will say). Second, because the sequences of experience are categorized in definite ways—in terms of a definite notion of what an object is, of what a cause is—and there is no way to know whether these categories of the understanding are ultimately true of things. All we can say is, "They are ours, it is our world." But our position is also *better.* Because the discovery of our necessary limitations, our subjection to our experience and our categories, is one of human reason's greatest discoveries, it is the great discovery of reason about itself. The very facts that from one point of view are to us limitations of human knowledge are from another the necessary conditions of all knowledge; and, therefore, in knowing these conditions once for all, we know once for all the general conditions or specifications or features anything must have in order to become an object of knowledge for us at all. And to know this is a traumatic increase of human knowledge.

Hence, to Hume's skeptical discovery that we cannot know, for example, that causation holds sway in nature, or that if it does, it will continue, that we know simply that certain experiences in fact follow other experiences, but that there is no necessity here, Kant's counter is this: the rule of causation and the other rules associated with the categories of the understanding are necessary in the sense that if they did not hold of the things of the world, there would be nothing to understand as a world of things. The categories of the understanding are interpreted by Kant as rules or laws that are imposed upon the material provided to thought by the system of the senses.

I note at once that we already have here a source of dissatisfaction with the more or less unrefined idea—to be found, it seems to me, in Lévi-Strauss's *Elementary Structures of Kinship*—that culture as distinct from nature is a realm of rules. What we understand as nature is also a realm of rules, that is, a realm, a world. For culture to be achieved, human beings, or rather rational creatures, must act, as Kant puts it, not merely in accordance with law but in accordance with the concept of law. We must understand ourselves as subject to law, and as the bringers of law. In both our participation in the world of nature and in the world of culture, reason acts as lawgiver, imposing order on our otherwise arbitrary and inconstant sensuous endowment. In each case reason provides our motions and our motives with that necessity and universality apart from which we would have no access to the objective, no idea of a world. (This hardly settles the Kantian question whether Reason is a unity.) In each case two worlds are discovered, and in each case there is between us and one of these worlds a barrier, establishing the condition of the world we normally live in as limited—call this the world of experience or of knowledge, or the public world, the shared world.

Kant's vision seems to tap various sources of our idea of our finitude, from the prohibitions in the Garden of Eden to the overreachers of tragedy to our various vague senses of unbridgeable distance from nature and from others; but his idea of a limitation on human knowledge fixed by the fixed nature of the human being has caused as much perplexity as it has conviction. Is his idea of limitation (whatever the particular limitations he draws) the necessary consequence of his philosophizing, or is it to be accepted rather as a Wittgensteinian "picture," some sort of rigid fantasy of how things must be, itself in need of deciphering?

Some twenty years ago I remarked that Wittgenstein's criticisms of metaphysical speculation in *Philosophical Investigations* are a continuation of Kant's critique of metaphysical speculation,[5] specifically on three counts: in the emphasis on the "possibilities of phenomena"; in the provision of philosophical diagnosis of philosophical failure; and in the appeal to the idea of limits in this diagnosis. By now the idea of a general relation between Kant and the later Wittgenstein seems to be easily accepted, so perhaps it is worth now specifying some differences. First, there is for Wittgenstein no final systematic form of philosophy in the face of which metaphysical speculation can be brought to a halt. Nor can you always tell by looking, so to speak (looking, perhaps, at the topic of a remark), whether a stretch of thought is metaphysically speculative. You have to try it out. The temptation to metaphysics becomes in Wittgenstein a will to emptiness, to thoughtless thought; and this is something that has to be resisted again and again, because the temptation to speculation, however empty, is as natural to the human creature as its criticism is. Second, the idea that what happens to the philosophic mind when it attempts speculation beyond its means is that it transgresses something we want to call limits, is an idea that cannot as it stands constitute a serious term of criticism for Wittgenstein but must remain merely a "picture," however significant. Kant, however, really does take the mind as *confined* in what it can know, takes it that there are things beyond the things we know, or something systematic about the things we know, that we cannot know, a realm of things-in-themselves, noumenal, open to reason, not phenomenal, not presentable. When Wittgenstein speaks of "bumps that the understanding has got by running its head up against the limits of language," the very obviousness of figurative language here works to suggest that thought is not confined *by* language (and its categories) but confined *to* language. And then we have to go on to ask, testing the picture: Is this really confinement? Is our freedom checked? From what are we withheld? I do not of course deny the presence of a *sense* of confinement here. On the contrary, I imagine that good answers to the questions I am asking will provide useful expressions of this sense, expressions concerning how we are to apprehend the picture of a metaphysical limit or barrier in our relation to the world and to others.

There is a notable difference in the ways we might grasp Kant's idea, as I put it, of reason as lawgiver, as world-creating, in the realm of the natural and in the realm of the social. In our knowledge of nature we seem to have no choice over whether the laws of our reason apply to it or not. What alternative could there be to the knowledge of nature? Ignorance of nature? But since Kant's problem is not a matter of knowing certain facts or specific physical laws of nature, but rather a matter of establishing the possibility of knowing nature at all, establishing the world of things as such, then ignorance of nature would mean our ignorance of such a thing as a world at all. To choose such ignorance would be like trying to choose to be an animal or an insect. Even that is not radical enough, since animals know something, even a totality of somethings. It would perhaps be expressible as our trying to choose to become a stone. In the case of our social life we *do* have a choice over whether the laws of the moral universe, "objective" moral laws, apply to us; which is to say, a choice over whether to apply them, as is implied in their presenting themselves to us as imperatives, matters, as it were, not fully natural to us. This is as we should expect. There is an alternative to moral goodness—moral evil. Moral evil is not merely a matter of falling short of the dictates of the moral law: our sensuous nature indicates to us that for all we know we always fall short. The matter is rather one of choosing evil, of choosing to thwart the very possibility of the moral life. Kant does not say much about this alternative, but I understand it in the following way. One inflection of the moral law is that its necessity and universality are to be viewed as holding in "the realm of ends," which may be thought of as the perfected human community. This realm is also a world "beyond" the world we inhabit, a noumenal realm, open to reason, standing to reason; but I am not fated to be debarred from it as I am from the realm of things-in-themselves, by my sensuous nature; for the perfected human community *can* be achieved, it may at last be experienced, it is in principle presentable. Yet, there is between me and this realm of reason also something that may present itself as a barrier—the fact that I cannot reach this realm *alone*.

Any teacher of philosophy will have some way of picturing our inaccessibility to the realm of things-in-themselves, say by a circle or a line, readily drawn on the blackboard, outside of which or below which our mental and sensuous faculties cannot penetrate. (Some teachers might draw the same ready diagram year after year for a lifetime, each time with more or less the same sense that our human fate is being inscribed or emblematized. I assume that some of these teachers will be on a good path, some on a bad, depending on their capacities for diagramming, that is, for allegorizing.) But if now I ask myself how I picture the barrier to the realm of ends, I find I draw a blank. Would a good picture be an outline of my body, as of the perimeter of my power? Or ought I rather to try imagining the collection of all persons apart from me, with whom I know I ought to be, but am not, in community? Or is the absence of a picturable barrier here due rather to my not attributing the limits of community to a set of circumstances (as, for example, the sensuous dimension of human nature) but to a condition of will, and I do not know how to picture the will? But what in particular about the will? If the eventual community of humanity is not merely something close to us that we are falling short of, but something closed to us, something debarred, then its nonexistence is due to our willing against it, to the presence of moral evil. This takes moral evil as the will to exempt oneself, to isolate oneself, from the human community. It is a choice of inhumanity, of monstrousness. Then our inability to picture ourselves as debarred from the social, or as debarring it, our drawing a blank here, may express a horror of this possibility, call it a horror of metaphysical privacy, as though picturelessness were a kind of namelessness. (This choice, or refusal to apply the moral law to ourselves, is not, I think, to be understood as the disobedience in which Paradise is lost. As creatures who have lost an immediate connection with commandedness, we are all disobedient; our obedience is forced, it is imperative, we would exempt ourselves if we could. Thoreau's way of saying this is to describe us as hard-of-hearing. Raskolnikov is not merely disobeying the law in a given case, refusing to universalize his maxim and act for the sake of the law. He might be conceived as attempting to refuse the law as such, to act for the sake of immorality, to become, let us say, unjudgeable. He purifies our wish for inhumanity. Whereas our everyday human, impure disobedience creates not hell but a restive and populous earth.)

Not knowing whether human knowledge and human community require the recognizing or the dismantling of limits; not knowing what it means that these limits are sometimes picturable as a barrier and sometimes not; not knowing whether we are more afraid of being isolated or of being absorbed by our knowledge and by society—these lines of ignorance are the background against which I wish to consider *It Happened One Night*. And most urgently, as may be guessed, I wish to ponder its central figure of the barrier-screen, I daresay the most famous blanket in the history of drama. I am not unaware that some of my readers—even those who would be willing to take up Kant and Capra seriously, or earnestly, in isolation from one another—will not fully credit the possibility that a comic barrier, hardly more than a prop in a traveling salesman joke, can invoke issues of metaphysical isolation and of the possibility of community—*must* invoke them if this film's comedy is to be understood. I still sometimes participate in this doubt, so it is still in part myself whose conviction I seek.

The blanket dividing the space, and falling between the beds, is the man's idea, as the principal pair, for the first of three times we will know about, prepare to share a cabin in an auto camp. The woman is understandably skeptical: "That, I suppose, makes everything all right." He replies that he likes privacy when he retires, that prying eyes annoy him, and goes on at once to situate the blanket allegorically: "Behold the Walls of Jericho. Maybe not as thick as the ones Joshua blew down with his trumpet, but a lot safer. You see, I have no trumpet." Wise in the ways of Hollywood symbolism, as generally obvious as the raising and lowering of a flag, we could already predict that the action of the film will close with the walls tumbling down. But then let us be wise enough, if we care about this film, to care about the rigors of this symbolism. The question the narrative must ask itself is how to get them to tumble. That this is a question, and what kind of question it is, is declared late in the film when the second blanket is shown unceremoniously pulled down by the suspicious owners of this second auto camp. Of course it is easy to pull it down if you do not know what it is, or care. So an early requirement for its correct tumbling is that the pair come to share a fantasy of what is holding it up.

An immediate complication is insinuated concerning who must use the trumpet. As the man, the wall in place, their spaces ready for the night, prepares to undress, he says: "Do you mind joining the Israelites?"—that is, get over to your side of the blanket. Now anyone who knows enough to refer to the Walls of Jericho—say a Hollywood script writer—knows that the Israelites are the attacking force and that it is they who have the relevant trumpets. Thus the man is repeating his claim that he has no trumpet and is adding that whether the walls come down will be up to whether the right sounds issue from her side of the wall. You may think this is pushing popular biblical study too far, but while it may be most common for audiences to interpret the allegory so that Clark Gable is Joshua and at the end blows the trumpet, it should be considered that we do not *see* this and that, for all we are apprised of, we are free to imagine that it is the woman who is still invited to make the move and who gallantly accepts the invitation. (So why don't we exercise that freedom?) If the trumpet is the man's, then presumably the blanket-wall represents the woman's virginity, or perhaps her resistance, even conceivably her reserve. I shall not deny that these symbolisms are in train here, but I wish to leave it open to the film to provide us with some instruction about what, a third of the way through our century and for a couple of persons not exceedingly young, virginity and resistance and reserve consist in, what the problem is about them.

I would not place such emphasis on the possible ambiguity concerning who blows the trumpet apart from my taking this film as one of a set of Hollywood talkies of the thirties and forties defining a genre I have called "the comedy of remarriage";[6] for it is an essential feature of that genre, as I conceive it, to leave ambiguous the question whether the man or the woman is the active or the passive partner, whether indeed active and passive are apt characterizations of the difference between male and female, or whether indeed we know satisfactorily how to think about the difference between male and female. This is why I have said that this genre of film rather refuses the distinction, made most usefully for me in the work of Northrop Frye, between Old Comedy and New Comedy, in the former of which the woman is dominant, in the latter, the man. This is also a reason I have also called the genre "the comedy of equality." Before going further into the genre, however, let us notice something else we know about the blanket-barrier from almost the first moment it is put up.

The woman has joined the Israelites, the man finishes changing into his pajamas and gets into his bed, the woman asks him to turn off the light, after which she begins hesitantly to undress. In one camera set-up we watch the blanket-screen with the man as it is rippled and intermittently dented by the soft movements of what we imagine as the woman changing into pajamas in cramped quarters. The thing that was to "make everything all right" by veiling something from sight turns out to inspire as significant an erotic reaction as the unveiled event would have done. Call this thing the elaboration or substitution of significance, call it the inspiration of significance, the beginning of a credit system. The barrier works, in short, as sexual censorship typically works, whether imposed from outside or from inside. It works—blocking a literal view of the figure, but receiving physical impressions from it, and activating our imagination of that real figure as we watch in the dark—as a movie screen works.

I cannot doubt that the most celebrated Hollywood film of 1934 knows that it is, among other things, parodying the most notorious event of the Hollywood film's political environment in 1934, the acceptance of the motion picture Production Code—the film industry's effort, it said, to avoid external censorship by imposing an internal censorship.[7] (Some avoidance; some originality.) The question posed by the parody may be formulated this way: If the film screen works like a kind of censoring, elaborating the effect of what it covers, how will you censor *that*?

Now we must start asking specifically what there is between just these two people that just this mode of censoring or elaboration is constructed between them. And for this a further elaboration of certain features of the genre of remarriage comedies will help. In "Pursuits of Happiness" I traced out an emphasis on the father-daughter relation that the comedy of remarriage inherits from Shakespearean romance, and I put together with this the absence of the woman's mother. The father's dominating presence is handled most wittily in *The Lady Eve* and most oratorically in *The Philadelphia Story;* but it is given its most pervasive handling in *It Happened One Night.* The entire narrative can be seen as summarized in the first of the newspaper headlines that punctuate it: Ellie Andrews Escapes Father. And throughout her escapades with Clark Gable, Claudette Colbert is treated by him as a child, as his child, whose money he confiscates and then doles back on allowance, whom he mostly calls "Brat," and to whom he is forever delivering lectures on the proper way to do things, like piggyback or hitchhike. After his first lecture, on the proper method of dunking doughnuts, she even says, "Thanks, Professor," a title more memorably harped on in *The Philadelphia Story.* In the genre of remarriage the man's lecturing indicates that an essential goal of the narrative is the education of the woman, where her education turns out to mean her acknowledgment of her desire, and this in turn may be conceived of as her creation, her emergence, at any rate, as an autonomous human being ("Somebody that's real," the man will say, half out of a dream-state, at the climax of the film, "somebody that's alive. They don't come that way any more.").

But perhaps I should justify including this film under the genre of remarriage at all, since while it is true that a later newspaper headline satisfyingly declares Ellen Andrews Remarries Today, what the film—or the newspaper—thinks it means is not that she is to marry the real object of her desire again. I might say that what a film, or any work, thinks it means—or what one might at first think it thinks it means—is not to be taken as final. I might, again, say that the matter of remarriage is only one of an open set of features shared by this genre of comedy and that the absence of that one feature may in a given instance be compensated for by the presence of other features. Most pointedly, here, a film that opens (virtually) with the following exchange between a daughter and her father—

> ELLIE. Can't you get it through your head that King Westley and I are married? Definitely, legally, actually married. It's over. It's finished. There's not a thing you can do about it. I'm over twenty-one, and so is he.
>
> ANDREWS. Would it interest you to know that while you've been on board, I've been making arrangements to have your marriage annulled?

—by that fact alone has a claim in my book to be called a comedy of remarriage, because a central claim of mine about the genre is that it shifts emphasis away from the normal question of comedy, whether a young pair will get married, onto the question whether the pair will get and stay divorced, thus prompting philosophical discussions of the nature of marriage. We might accordingly say here that the issue of remarriage is present but displaced. (Is there a reason this film opens on a yacht, beyond the obvious economy in establishing a setting of luxury? A boat is a good place for a father to confine a daughter without brutality, as, say, by locking her in a tower; and a ship's captain is empowered to perform a marriage ceremony but not to grant a divorce—as if the latter had not the same urgency. Yet, at the end the father-captain will perform a kind of divorce ceremony [called buying someone off], and it is declared to be urgent.)

The idea of displacement seems to me right as far as it goes, but it does not explain how the issue gets displaced onto just this pair, what it is about them that invites it. It feels at the end as if they are marrying again, and not merely because of the plain fact, significant as it is, that the wedding night is shown to be set in yet another auto camp—which thus repeats two of the three nights they have already spent together—but specifically because what we have been shown in the previous auto camps is something like their marriage. We know of course that they have not been legally, actually married, but we also know that those things do not always constitute marriage, and we may freely wonder what does. Our genre is meant to have us wonder. The opening exchange between daughter and father, leading up to the response about annulment just quoted, had gone as follows.

> ELLIE. I'm not going to eat a thing until you let me off this boat.
>
> ANDREWS. Aw, come now, Ellie. You know I'll have my way.
>
> ELLIE. Not this time you won't. I'm already married to him.
>
> ANDREWS. But you're never going to live under the same roof with him. Now I'll see to that.

As if living under the same roof were the consummation apart from which a marriage may be annulled. The night of the second auto camp, which succeeds the night in the hay, followed by a whole day of walking and hitchhiking and giving a thief a black eye for his car, the pair achieves something like marital familiarity as they prepare for bed, a familiarity heightened by the fact that what they are discussing is the intimate topic of never seeing one another again, and by the surrealist matter-of-factness with which the man goes about the business of hanging the blanket-wall-screen before each matter-of-factly undresses for bed. They are living under the same roof.

This familiarity is prepared by a former one, equally if oppositely powerful, at the first auto camp, when their breakfast is interrupted by Ellie's father's private detectives and the pair pretend to be a working-class married couple. Or rather, since in taking the cabin together they were already pretending to be man and wife (or pretending so again, since they have *already* already pretended as much, to put the quietus on the loudmouth forcing his attentions on her on the bus), we might say they are giving a charade of marriage. While this also does not achieve marriage, it does achieve the earlier of the familiarities I mentioned, since it makes their pretense of marriage by contrast seem an almost natural estate. The form the marriage charade takes is yet more significant. The pair mean the routine to convince hardened, suspicious observers on the spot that they are a seasoned couple, and their knockdown proof is to bicker and scream at each other. This laugh over the misery of a squalid, routine marriage poses at the same time a puzzle over the almost incessant bickering the pair have engaged in on their own from the instant they meet and dispute a seat on the bus. As if there may be a bickering that is itself a mark, not of bliss exactly, but say of caring. As if a willingness for marriage entails a certain willingness for bickering. This strikes me as a little parable of philosophy, or of philosophical criticism.

The exchanges of comedy span the quarrels of romance and the tirades of matrimony, arguments of desire and of despair. So essential are these arguments to the genre of remarriage that it may be taken above all to pose the problem: What does a happy marriage *sound* like? Since the sound of argument, of wrangling, of verbal battle, is the characteristic sound of these comedies—as if the screen had hardly been able to wait to burst into speech—an essential criterion for membership in that small set of actors who are featured in these films is the ability to bear up under this assault of words, to give as good as you get, where what is good must always, however strong, maintain its good spirits, a test of intellectual as well as of spiritual stamina, of what you might call "ear."

In this, as in other respects, these comedies illustrate, or materialize, the view of marriage formulated in John Milton's eloquent *Doctrine and Discipline of Divorce*, which I might describe as a defense of marriage in the form of a defense of divorce. It will further my argument to insist on this a little by quoting a summary statement from Chapter 2 of Milton's theological point of departure.

> And what [God's] chief end was of creating woman to be joined with man, his own instituting words declare, and are infallible to inform us what is marriage and what is no marriage, unless we can think them set there to no purpose: "It is not good," saith he, "that man should be alone. I will make him a helpmeet for him" (Genesis 2:18). From which words so plain, less cannot be concluded, nor is by any learned interpreter, than that in God's intention a meet and happy conversation is the chiefest and noblest end of marriage, for we find here no expression so necessarily implying carnal knowledge as this prevention of loneliness to the mind and spirit of man.

(An Existentialist may regard hell as other people, as in Sartre's *No Exit.* But for a sensibility such as Milton's, myself am hell.) A modern reader of this passage is apt to feel that Milton's meaning of conversation in marriage is too remote from what we mean by conversation to apply to the exchanges between the pairs of our comedies. But why? Because Milton means something more by conversation than just talk, because he means a mode of association, a form of life? We might say he means something more like our concept of intercourse, except that our word conversation explicitly, if less generally, also carries the sexual significance as well as the social (as in the legal phrase "criminal conversation"). Contrariwise, Milton does also mean talk, as in the phrase "mute and spiritless mate" from Chapter 3—or at the least he means articulate responsiveness, expressiveness. More important, the films in question recapture the full weight of the concept of conversation, demonstrating why *our* word conversation means what it does, what talk means. In those films talking together is fully and plainly being together, a mode of association, a form of life, and I would like to say that in these films the central pair are learning to speak the same language. (Of course this is learning to hear, to listen, as if loving and honoring were already grasped in the correct or relevant mode of obeying, the promise of which is marriage.) That the language is private or personal or contains privacy is suggested by its being made explicit that they alone know what "the Walls of Jericho" means (though we are privy to its meaning). Their extravagant expressiveness with one another is part of the exhilaration in these films, an experience in turn possible only on the basis of our conviction that each of them is capable of, even craves, privacy, the pleasure of their own company. We understand something like the capacity for their pleasure, under threat by the erotic charge between them, by the demand to forgo one autonomy for another (or one idea of autonomy for another), to cause their hot hostility toward one another.

What this pair does together is less important than the fact that they do whatever it is together, that they know how to spend time together, even that they would rather waste time together than do anything else—except that no time they are together could be wasted. Here is a reason that these relationships strike us as having the quality of friendship, a further factor in their exhilaration for us. Spending time together is not all there is of human life, but it is no less important than the question whether we are to lead this life alone.

In stressing the ascendancy of being together over doing something together, the problem of those narratives requires a setting in which the pair have the leisure to be together, to waste time together. A natural setting is accordingly one of luxury, or as Frye puts it concerning romances generally, a setting for snobs. At least the settings require central characters whose work can be postponed without fear of its loss, or in which the work is precisely the following of events to their conclusions (rather than the gridding of days into, say, the hours of nine to five), as, for example, the work of a newspaper reporter. *Bringing Up Baby* presents the purest example of a relationship in which the pair do next to nothing practical throughout our knowledge of them; what they do is something like play games; you could almost say they merely have fun together, except that it takes the entire course of the film for the man to come to the essential insight about himself that he was throughout having fun. I would like to say that they achieve purposefulness without purpose. It is because of this purity of action that people sometimes find this the hardest of these films to take.

But is it true of *It Happened One Night* that the pair are really wasting time together? After all, what she is doing is running away, and what he is doing is his job, getting a scoop. I do not wish to answer this merely by saying that it turns out that they are not doing those things really. They may have been doing them and then changed their minds at the last moment. I do not even wish to answer merely that they begin changing their minds almost from the first, say, as a result of the marriage charade. I also wish to ask whether one can accept any such description of their work—as escaping and as scooping—as dictating the way they have throughout behaved toward each other, his fathering and lecturing her, her playfulness and her achievement of humility. I will later dwell on the man's confusion toward the end in leaving the woman asleep and going to sell his scoop. Let me call his confusion, by way of anticipation, a matter of trying to sell the fiction that he has just at the end changed his mind, that this happened just last night, just one night, instead of long ago, and continuously—I mean, sell this to himself.

The recent theme of ambivalence, of the pair's revolving positive and negative charges, together with the theme of activeness and passiveness touched upon before, must also require placement for us in certain texts of Freud—for example, in this juxtaposition from *Civilization and Its Discontents*, footnoting some factors that contribute to civilization's dampening of "the importance of sexuality as a source of pleasurable sensations, that is, as a means of fulfilling the purpose of life":

> If we assume it to be a fact that each individual has both male and female desires which need satisfaction in his [or her?] sexual life, we shall be prepared for the possibility that these needs will not both be gratified on the same object, and that they will interfere with each other, if they cannot be kept apart so that each impulse flows into a special channel suited for it. Another difficulty arises from the circumstance that so often a measure of direct aggressiveness is coupled with an erotic relationship, over and above its inherent sadistic components. The love-object does not always view these complications with the degree of understanding and tolerance manifested by the peasant woman who complained that her husband did not love her any more, because he had not beaten her for a week.[8]

This last turn of masculine humor, by the way, is taken up precisely as *It Happened One Night* is winding up. The woman's father asks the man whether he loves his daughter (having already seen it proved that he does not love his daughter's money). One of the man's responses is this: "What she needs is a guy that'd take a sock at her once a day whether it was coming to her or not." The father smiles, understanding this as a trustworthy expression of true love; he has found the man after his own heart; someone, as he will put it to his daughter, to make an old man happy.

Before deciding that we have here one more example of a Stone Age he-man, portrayed by a royal member of the species of the Hollywood he-man, and licensed by the director whose sentimentality is just the other face of the fixated split between the masculine and the feminine, let us continue our supposition that this film has something to teach us about our pursuits of happiness.

I think we should be surprised, given a certain conventional view of what Clark Gable is, to find him capable of the sharp and playful conversation our genre requires. Then we must be prepared for astonishment if we are to perceive the region of this he-man temperament called upon in the breakfast sequence that prepares the staging of the marriage charade that first morning after the first night in an auto camp. He has walked into the cabin with a full grocery bag, tossed over to her, still in bed, a package that turns out to contain a toothbrush, gruffly ordered her to get out of bed and to take a shower and get dressed because breakfast will be ready in no time, given her his robe and slippers to wear, and he turns to preparing a meal; he has already, it emerges, pressed her dress. Gable is being parental, and he's so good at it that you don't know whether to consider that the paternal or the maternal side of his character predominates. One would like to say, in view of the representations he has made to be married to her, that he is being a husband who understands that role as a classical commitment to being both father and mother to the woman, except that his behavior so far seems produced not by a response to her but by some conception he has of himself. The revelation of his nurturant side is matched by the revelation of her appreciation of it, neither resenting it nor taking it for granted.

A major thematic development is underway, based on food. Here are the opening words of the film, preceding the initial interview quoted earlier between father and daughter.

ANDREWS: On a hunger strike, eh? How long has this been going on?

CAPTAIN: She hasn't had anything yesterday or today.

ANDREWS: Send her meals up to her regularly?

CAPTAIN: Yes, sir.

ANDREWS: Well, why don't you jam it down her throat?

CAPTAIN: Well, it's not as simple as all that, Mr. Andrews.

ANDREWS: Ah, I'll talk to her myself. Have some food brought up to her.

CAPTAIN: Yes, sir.

And then the father's object during the ensuing interview is to get his daughter to accept food from him; he even tries to feed her, but she responds as though he is trying to jam something down her throat; and when she deliberately knocks to the floor the tray of food he has had sent up, he slaps her, upon which she runs from the cabin and dives from the yacht to escape him. The angry refusal of food is thus directly established as an angry, intimate refusal of love, of parental protection; the appreciative acceptance of food in the auto camp cabin asserts itself as the acceptance of that intimacy. This relation has also been prepared earlier by the man's having denied food to her on the bus. It occurs just after he has moved out the flirt by claiming to be her husband. Colbert orders a box of chocolates from a vendor on the bus and Gable sends the boy away. He explains this husbandly act by saying that she can't afford chocolates and telling her that from now on she's on a budget; but the implication is clear enough that he is instructing her not merely in what is worth spending but in what is worth eating, say in what is worth consummation. (And in what manner what is worth consuming is worth consuming—recall the lecture on doughnut dunking.)

The next night, in the field, she complains of hunger, and when later the man, after disappearing, returns with a bunch of carrots, she refuses them, saying she's too scared to be hungry. The next morning he offers them again:

> ELLIE: What are you eating?
>
> PETER: Carrots.
>
> ELLIE: Raw?
>
> PETER: Uh-huh. Want one?
>
> ELLIE: No! Why didn't you get me something nicer to eat?
>
> PETER: That's right, I forgot. The idea of offering a raw carrot to an Andrews. Say, you don't think I'm going around panhandling for you, do you? Better have one of these. Best thing in the world for you, carrots.
>
> ELLIE: I hate the horrid things.

He is exasperated by the irrationality of her refusal of good food, perhaps by the return of her past over her recent show of genuine feeling, and perhaps he would like to jam the good food down her pretty throat.

Ellie's refusal here aligns Peter even more directly with the opening position of her father, and it sets up a repetition of the earlier pair of actions toward food: again Peter denies her something to eat, again for a moral reason, and as a result she soon accepts food that he has provided for her. The man giving them a lift has stopped in front of a lunchroom:

> DRIVER: How about a bite to eat?
>
> ELLIE: Oh, that would be love—
>
> PETER: No thanks. We're not hungry.
>
> DRIVER: Oh, I see. Young people in love are never hungry.
>
> PETER: No.
>
> . . .
>
> PETER: What were you going to do? Gold-dig that guy for a meal?
>
> ELLIE: Sure I was. No fooling, I'm hungry.
>
> PETER: If you do, I'll break your neck.

When they get out of the car to walk around and stretch their legs, the driver hurries out of the lunchroom and takes off with their belongings. Peter runs after the car. After a dissolve, Ellie is waiting beside the road and Peter shows up in the car alone. As they drive off Peter asks Ellie to take the things out of the pocket of his coat, which she is holding, to see what they might exchange for gasoline. One thing she finds in the pocket is a carrot, which, after a hesitation, overcoming something, she begins slowly to nibble, hunching down inside herself. Seeing her eating this food of humility, Peter is won to her. He had liked the taste she showed in people (except for the man she got married to, but then as her father had said, she only did that because he told her not to) but he had despised her sense of exemption from the human condition, a sense he calls her money. Eating the carrot is the expression her acceptance of her humanity, of true need—call it the creation of herself as a human being. No doubt he is also won because eating the carrot is an acceptance of him, being an acceptance of food from him. It is also an acceptance of equality with him, since he has been living on that food. (In one discussion of these matters it was pointed out to me that a carrot is a phallic symbol. I confess to feeling sometimes that certain information is after all really better repressed. But in case someone finds himself or herself saddled with this thought of the carrot, I may mention that thirty years further down the road of feature-film making, this region of male nurturance, connected with the attempted creation of a woman, and of a perfected society, found itself under consideration.)[9]

It is pertinent at this stage of his being won that the food is raw (a point insisted upon by her earlier), which means that he has provided it, out of his masculine capacity, but not prepared it, out of his feminine capacity. Out of *which* masculine capacity—fathering or husbanding? I am reminded here of an observation of Margaret Mead, quoted by Lévi-Strauss in *The Elementary Structures of Kinship:*

> An Arapesh boy grows his wife. As a father's claim to his child is not that he has begotton it but rather that he has fed it, so also a man's claim to his wife's attention and devotion is not that he has paid a bride-price for her, or that she is legally his property, but that he has actually contributed the food which has become flesh and bone of her body.[10]

I adduce this bit of anthropological observation not as a confirmation, in a conventional or professional sense, of what I have been saying. It is just as much the case that what I have provided is confirmation of that observation—or else my experience of the film is inaccurate and improvident.

I quote it rather to help measure a question that is bound sooner or later to make its way to this discussion—namely, whether I am seriously suggesting that Frank Capra is to be understood as intending to draw the distinctions I have invoked between providing and preparing food and the parallels between the woman's two refusals of the offer of food and the pair of denials of food to her, followed by her acceptance of humbler food, and so on. If such a question is asked rhetorically, I might reply that it strikes me as based on a primitive view of who Frank Capra is, or any authentic film director, and a primitive view of what a Hollywood film is, or film generally, and a primitive view of what having an intention is. Or, I might rather say that one would do well to try conceiving of Capra as possessed of as usable a set of intellectual operations as your average primitive mind. Naturally, these impatient replies do not answer questions, raised nonrhetorically, about how to understand what the director of a film is and what his or her intentions are, which, first of all, means to understand what a film is. The primitive mind, the human mind, can mean things because it has the medium of human culture within which to mean them, and mean itself, where things stand together and stand for one another. The genre of remarriage is a small medium of this sort, wherein distinctions can be drawn and, hence, things intended.

The intentions can get reasonably refined. We are about to consider the sequence in which the crisis of the film occurs on the line "Boy, if I could ever find a girl who's hungry for those things . . . ," and I claim that the energy of the emotions we have seen concerning food is concentrated into that idea of hunger. The film can be said to be about what it is people really hunger for, or anyway about the fact that there really is something. (Sometimes, it is not denied, this really is literal food, as in the Depression vignette of a mother on the bus fainting from what her crying child informs us is hunger, and Ellie gives the child the bulk of the money she and Peter have between them. One must have a heart of stone to witness Capra's virtuosity in pathos without laughing.) And, one way or another, an early exchange as Peter is preparing their beds of straw in the open field may make itself felt as a summary of what the film is about.

> ELLIE: I'm awfully hungry.
>
> PETER: Aw, it's just your imagination.

(Not unworthy of Beckett.) Will it be objected that we can hardly be expected to remember such transient identifications on just one viewing—particularly, I might add, since the style of such films, of film as such, tends to throw lines of significance away, quite as if transience, hence improvisation, were part of the grain of film. But does this assume that films are on the whole *meant* to be viewed just once? Films such as this one are meant to *work* on just one viewing, but that is something else. (It is not another matter, however, because the issue of the transient speaks to what we are to understand as the popular in art.) However, I wish to be reasonable about the question of intention. I earlier quoted a passage that contains the juncture

> How about a bite to eat?
> Oh, that would be love—

and to that I am willing to say that, if you don't see in it another announcing of the film's subject, I will not insist upon it. I might still go on to ask how far one is prepared to go with Freud's insistence that the life of the mind contains no accidents. If this is modified to say that, in matters native to oneself, one does nothing by accident, then I will simply claim that making Hollywood romances is something native to Frank Capra.

(In trying for a laugh about Capra's "Depression vignette," I am not denying that the Depression has a bearing on the appearance of this and our other films. I am rather insisting that these films may themselves be capable of reflecting on what it is that causes them, hence that they may have some bearing, for example, on our experience and understanding of the Depression. I do not find it helps very much to say, as I believe it is common to say, that people who had too little money in the thirties enjoyed watching people who had too much, enabled either to identify with those pleasures or to repudiate them. Even if these are the ways in which certain films of the period (or of any period) were and are appropriated, and meant to be, it does not say why our films are as they are. And without knowing how to think in detail about how they are, why the specific events in them are as they are, we are not apt to propose much in the way of an explanatory causal process between them and something else. In a film that is in a certain sense about hunger, together with imagination, it may be that we are asked to reflect that the Depression is one of the formative crises of the imagination of America, one of the times we were forced, or permitted, to imagine most fundamentally what it is we want of our society, what we ask of the social as such. Since I think that this is indeed a forming preoccupation of our genre as a whole, I think it will be possible eventually to see that in some sense the Depression has everything to do with its appearance.)

The woman's eating of the carrot closes the sequences of the night in the field and the following day on the road, and prepares for the pair's third night together, their second in an auto camp cabin, which sees the climactic transgression of the blanket-wall-screen barrier.

We have noted the particular familiarity in which the pair have now become a couple, preparing for bed; and I have called attention to the intimacy of their speaking of never seeing one another again. There ensues an exchange of words that we must hear at length. He is in his bed, smoking, thinking. She is sitting on her bed getting undressed and into her pajamas, that is, his pajamas, as on that distant night before last.

> ELLIE: Have you ever been in love Peter?
>
> PETER: Me?
>
> ELLIE: Yes, haven't you thought about it at all? Seems to me you could make some girl wonderfully happy.
>
> PETER: Sure I've thought about it. Who hasn't? If I ever met the right sort of a girl, I'd—. Yeah, but where are you going to find her, somebody that's real, somebody that's alive? They don't come that way any more. I've even been sucker enough to make plans. I saw an island in the Pacific once. Never been able to forget it. That's where I'd like to take her. But she'd have to be the sort of girl that'd jump in the surf with me and love it as much as I did. You know, those nights when you and the moon and the water all become one and you feel that you're part of something big and marvelous. Those are the only places to live. Where the stars are so close over your head that you feel you could reach right up and stir them around. Certainly I've been thinking about it. Boy, if I could ever find a girl who's hungry for those things—

And now the crisis. We have cut to close-ups of Ellie two or three times during Peter's speech, and at last we cut to her just coming toward him around the blanket. She pauses, holds on to the blanket's edge, and we reframe to a tighter close-up of her in soft focus, the visual field blurred as if seen through a mist of happiness, or a trance of it. Then she approaches his bedside, falls to her knees, throws her arms around his neck, asks him to take her with him, and declares her love for him. He seems unmoved, paralyzed, and tells her she'd better get back to her bed. She apologizes, hurriedly retreats back to her side of the barrier, throws herself onto her bed, and sobs. The camera has jumped back as she returned to her side, allowing the blanket to be seen from the edge, dividing the screen frame in half, and depicting the full geography of transgression. It seems, in itself, hardly significant, nothing more than an auto camp cabin. Then, a dissolve from her asleep back to him with his cigarette burnt down conventionally states a lapse of some minutes. He calls out, "Hey, Brat. Did you mean that? Would you really go?" It is late for that question, and he seems stupefied. I understand him as trying to awaken from a trance. He gets up and looks over the barrier to discover that she is asleep, and he hurriedly dresses and leaves, we discover, to sell their story to his old editor. He tells him that he's in a jam and needs a thousand bucks. He says, mysteriously, that it is to tear down the Walls of Jericho. What is going on?

We understand her well enough. The man's recital of his wish for love is something we have seen penetrate her as she follows it; her body expands with the imagination of what he is envisioning; her head arches back as her eyes close; her state is depicted as openly, as theatrically, as Bernini depicts a statue of St. Teresa. She is drawn toward Peter's vision, hence to Peter. (Though someone may rather characterize her the other way around, as being drawn to Peter and hence to his vision. But we have before this had sufficient evidence that she is already drawn to Peter, if this means attracted to him; and what draws her to him has always been something like his vision. The question that remains is what draws her to declare herself. And if this is a matter of asking why she listens to him now, that becomes the question why he speaks now. He speaks of love because she has asked him to. Then why does she ask him now, and why does he answer? It would be an answer to both questions to say that she has accepted the carrot.) The soft focus is a sign of her yielding, that she is tender. The stars in her eyes signal a trance. But are they not the stars present in his words, hence shared, hence objective? It is the man whose behavior is mysterious.

When he becomes aware of her presence, what does he see? Are we to take it that, unlike the case of the woman, the soft focus is something he sees as well as some way in which he sees it? He sees that some vision qualifies her state, that she is entranced, but it is not evident to him what or how she sees. This seems to be what the closer reframing on her means as she rounds the edge of the barrier: since the first framing of her is presented as from Peter's point of view, it follows that the succeeding reframing is exactly not from that point of view, but rather that what it presents is something still private to her (and us). We have to imagine that Peter surmises something of her mood, since the first and second framings of her are not unrelated (which is what the idea of reframing should convey). It is this that leaves him, that turns him, cold to her—say objective—as she throws herself at him. His focus is going hard again. Here is Capra taking on responsibility for the Hollywood device of soft focus, raising for us the ontological question: If soft focus registers a modification of viewing, how is hard focus different? Is it merely one modification among others, or is it privileged to escape modification altogether? Or should we seek to define it as a modification of viewing but nevertheless a privileged one? Gable's shift of mood from soft to hard provides one interpretation of (what seems to be) ordinary focus, an interpretation of it as cold, or let us say inquisitive. Focus is a necessary condition for viewing film, as is each condition for exposing film. These conditions are no more to be sidestepped in viewing film than the pure forms of sensible intuition (that is, space and time) in *The Critique of Pure Reason*. If we are to find a way to speak of these conditions of viewing film as transcendental, we must equally find a way to speak of them as empirical, for certainly they are only to be discovered empirically, or rather discovered in what I call acts of criticism.

The woman believed she was walking into the man's dream or vision. So she was, and it woke him up, or brought him to. Why? Is it because she is not the figure of his vision or because she is? Both.

That she is the woman of his dreams seems to me specifically announced in his recital of his dream, his expression of it, no more importantly by what he says than by his saying of it to her, in those circumstances. His invocation of "those nights when you and the moon and the water all become one and you feel you're part of something big and marvelous. . . . Where the stars are so close you feel you could reach right up and stir them around" is of something he is wishing for all right, but more directly I take it as something he is recalling, their previous night together, in the open. The transcendentalism of his vision of oneness with the universe is an exact response to the American transcendentalism of Capra's exteriors, a mode of vision inherited from German expressionism, both in the history of Hollywood and in the history of philosophy. (Capra's handling of emotion, or sentiment, what I earlier referred to as his virtuosity of pathos, seems to me rather to bear an Italian stamp—the equivalent, and surely the equal, of Puccini's.) Kant finds that man lives in two worlds, and camera and screen seem an uncanny, unpredictable realization of the human aspiration, or projection, from the one to the other. (I would like film's manifestation of this idea of Kant's to be thought of in connection with my speaking of film as giving to its subjects an inherent self-reflection, a mutual participation of objects and their projections.[11])

What happened one night is that the man took the woman to his island. He carries her across a body of water that Capra's camera, in something like soft focus, shows so brilliant with reflected skylight that there seems no horizon, no break between the earth and the heavens, so that you feel you might reach anywhere and stir the stars. And the place he takes her to is as isolated as an island and is home to him, as is shown by his knowing where the carrots are, and they and the moon and the landscape all become one, as movingly a part of something big and marvelous as any expressionist painterly composition by a movie camera can achieve. The way he carries her across the water is emphasized by his lecturing to her to the effect that what they are doing is by no means piggybacking. He is here not treating her, I mean carrying her, as a child, but over his shoulder. If you call this a fireman's carry, then say that it is accordingly a carry of rescue, as of a hardy damsel. And if we shall not refer to it as the style of a caveman, let us at least note that it takes the posture of abduction.

Then we have again to ask why he withdraws from her when she is drawn past the barrier to his side of things; moreover, when her being drawn seems to remove the remaining impediment to the marriage of their minds. In the previous sequence she accepted her relation to common humanity, and in crossing the barrier she accepts the role of Israelite; the initiating sound has come from her side of things. What is the matter? Why, after all, is he surprised by her? Why can he not allow the woman of his dreams to enter his dream? But just that must be the answer. What surprises him is her reality. To acknowledge her as this woman would be to acknowledge that she is "somebody that's real, somebody that's alive," flesh and blood, someone separate from his dream who therefore has, if she is to be in it, to enter it; and this feels to him to be a threat to the dream, and hence a threat to him. To walk in the direction of one's dream is necessarily to risk the dream. We can view his problem as one of having to put together his perception of the woman with his imagination of her. This would be precisely to tear down the Walls of Jericho. It is a way to frame a solution to the so-called problem of the existence of other minds.[12] The genre of remarriage invites us to speak of putting together imagination and perception in terms of putting together night and day—say, dreams and responsibilities. Each of its instances has its own realization of this project. But the sublimest realization of it in film is Chaplin's *City Lights.*

Surely, it will be said, a simpler explanation for Peter's rejection of Ellie's advances is that legally she has a husband. But, first of all, Peter could have said that; and second, that seems not to bother him a few moments later when Ellie is back on the other side of the barrier. And how would this explanation accord with Peter's leaving to get a thousand dollars in order to tear down the Walls of Jericho, and by selling their story? It is a very mysterious nest of actions.

Whatever the actions mean, the fundamental fact about them is that he leaves, he continues his withdrawal from her, he panics. It is that fact that any explanation must explain. I know he has his reasons and his intentions to return and so on (including some reason why he doesn't wake her and tell her his plans or indeed go so far as to take her with him?). Maybe he thinks that after the hard night confessing her love and sobbing she needs a good sleep. As he heads back with his money and his elation (as if he has escaped from something) he says to his car, "Come on baby, come on, we've got to get there before she wakes up." He has wanted her asleep during this escapade. He does not want her to wake up to the fact that he abandoned her when she crossed the barrier to him; he wants to be able to give her a good, daytime reason for his paralysis; so he abandons her again. What he goes on to do must therefore remain mysterious, as cover stories will. This failure on his part is never fully compensated for. It remains an eye of pain, a source of suspicion and compromise haunting the happy end of this drama. So, at any rate, I assume in looking further for explanations.

There is another cultural or psychological interpretation of his withdrawal, another impediment that the man may feel the woman has transgressed; one that is not an alternative to her metaphysical transgression in presenting herself as somebody real, somebody alive; but rather one in which the cultural and the metaphysical interpret one another. This is the natural cultural impediment of their having ostensibly based their relationship on the tie between father and daughter, according to which they are not free to take one another as independent sexual objects. But we have all started from familial attachments, and if we are to proceed in satisfaction—call this marriage—exchanges of one mode of love for another are to be negotiated. What is the particular problem of the central pair of *It Happened One Night?*

But having seen that they have a problem, at least that the man has one, why suppose that this is particular, if this means peculiar to them? It may just be peculiar to romance that it studies the problem of the romance of love not as an individual but as a metaphysical problem, projecting characters free of private problems (free of economic struggles, for example), or rather characters whose problem is exactly that of metaphysical privacy. They trace the progress from narcissism and incestuous privacy to objectivity and the acknowledgement of otherness as the path and goal of human happiness; and since this happiness is expressed as marriage, we understand it as simultaneously an individual and a social achievement. Or, rather, we understand it as the final condition for individual and for social happiness, namely the achieving of one's adult self and the creation of the social. (This does not deny that privacy is also a happiness and publicness also a loss, even the publicness of marriage; hence, it does not deny that comedy cannot just be happy.)

If we express the condition of marriage as one in which first a kinship is to be recognized and then an affinity established, we have a possible explanation for a genre of romance taking the form of a narrative of remarriage: a legitimate marriage requires that the pair is free to marry, that there is no impediment between them; but this freedom is announced in these film comedies in the concept of divorce. (In *The Lady Eve* the woman sets as her sole condition for giving the man a divorce that he come and "ask me to be free." I am encouraged in this connection by Bernard Knox's "*The Tempest* and the Ancient Comic Tradition,"[13] to think through the films of remarriage, especially in their relation to Shakespearean romance, as comedies of freedom.) But then this implies that a prior marriage or affinity is in question. This original affinity may or may not be depicted as a legal one; but it is essential that its originality be seen to be, let us say, a natural one. In *The Philadelphia Story* the pair are said twice to have "grown up together"; in *Bringing Up Baby* they are shown becoming children again (something Howard Hawks pushes to extravagant literality in *Monkey Business*); in *The Awful Truth* they are finally referred to by childlike figurines; in *It Happened One Night* the whole escapade of escape may strike one as a set of games, but especially the game of playing house, or playing at being married. But this natural relationship is a kinship from which freedom to marry is precisely to be won. Without the kinship, the eventual marriage would not be warranted; without the separation or divorce, the marriage would not be lawful. The intimacy conditional on narcissism or incestuousness must be ruptured in order that an intimacy of difference or reciprocity supervene.[14] Marriage is always divorce, always entails rupture from something; and since divorce is never final, marriage is always a trangression. (Hence marriage is the central social image of human change, showing why it is and is not metamorphosis.)

So it is no wonder that Peter is confused by Ellie's appearance to him, and he is not to be blamed for an act of rupture, or abandonment, that he cannot heal. We might understand his leaving her asleep as his intuition that they require, and his going in search of, a divorce; and understand his failure to accomplish this as his discovery that it cannot be accomplished alone. His task reverses, or reinterprets, the story of Sleeping Beauty: the prince wishes for the maiden to stay asleep until he finds his way to the authority to kiss her, but a witch has put a curse on her to awaken, after a hundred years, a moment too soon.

Another witch must have modified the curse so that the faithfulness of the prince attracts the favor of the maiden's father. Classical comedy often presents the escape from the father as the expulsion from the woman's life of an old male figure, someone in the role of "senex." In the film comedies of remarriage it seems to be a law that if the woman's real father is present, he is never on the side of the senex, or father figure, but always on the side of the man with whom his daughter has throughout the drama been seeking, and seeking to avoid, divorce. The magic in the relation between father and daughter is noted in two junctures of *It Happened One Night*, which I take as comic confessions that this film knows its complicity in the tradition of romance. The first is the daughter's being awakened the first morning of her escape by the sound of her father's airplane passing overhead, as if she had been dreaming of him in pursuit. The second is the father's arranging to put a headline in the newspaper, which is then revealed as being in the hands of his daughter; he contrives to get a message to her, not knowing where she is, not by using the personal columns of the paper but by using the medium of the newspaper as such as his personal means of communication with her. This Prospero is playing his own Ariel. (The image of the airplane sets up a further comic moment of contrast with the senex-husband, who insists on entering the wedding ceremony from an "autogyro," an act of vanity, of the merely autoerotic. Yet this dunce *ex machina*, by his "dumb stunt" [as the father calls it], helps the sudden averting of the catastrophe, by displaying what a male catastrophe he is. The spirit of comedy continues to work in mysterious ways.) The role of the fantastically rich father shows the limitation of the (modern) father's powers. He can no longer *give* the bride, he can merely use his personal standing with her to persuade her to give herself to a better man. When he says he can buy off her legal husband with a pot of gold, he is admitting that a true husband cannot (any longer) be bought, perhaps because the honor of a modern husband lies not in the greatness of his price but in his having no price, as if we are no longer in a position to tell the difference between a gift and a bribe. Even if reduced in this way, however, this father participates in his ancient role of magus in ousting the senex, in lending what authority he has to his daughter's flouting of convention. His limitation also emphasizes that she is, as France says of Cordelia, her own dowry. Otherwise, there is no romance.

To be your own dowry turns out to mean to give yourself. And the woman gives herself to the man who genuinely wins her. The woman's giving herself looms so large as a feature of modern (European) marriage that I cannot forbear giving a final citation from Lévi-Strauss that speculates on its origins. It has a foundation in

> the *swayamvara* marriage, to which a whole section of the Mahabharata is devoted. It consists, for a person occupying a high social rank, in the privilege of giving his daughter in marriage to a man of any status, who has performed some extraordinary feat, or better still, has been chosen by the girl herself. . . . [*S*]*wayamvara*, the marriage of chance, merit, or choice [rather than of gift by kindred], can really

> only have meaning if it gives a girl from a superior class to a man from an inferior class, guaranteeing at least symbolically that the distance between the statuses has not irremediably compromised the solidarity of the group, and that the cycle of marriage prestations will not be interrupted. This is why the lower classes have a major interest in the *swayamvara*, because for them it represents a pledge of confidence.[15]

This natural explanation for the popularity of these comedies also provides terms for an account of two respects in which *It Happened One Night* differs from each of the other main instances of the genre of remarriage, from *Bringing Up Baby*, *His Girl Friday*, *The Awful Truth*, *The Philadelphia Story*, *The Lady Eve*, and *Adam's Rib*. First, the man is emphatically from a lower social rank than the woman. Second, there is nothing that corresponds to the feature of "the green world," a natural setting to which in the other instances the action moves, most often from the city of New York, in order for the principal pair to gain perspective on themselves and to regain their origins with one another. (In "Pursuits of Happiness" I observe that in more than half of these comedies this place of perspective is called Connecticut.) Instead, we have here a picaresque form, the narrative is on the road, and instead of memory and reciprocation, *adventurousness* is given the scope it requires in order to win out.[16]

That the barrier works like a movie screen means that our position as audience is to be read in terms of the man and woman's positions with each other, and especially in terms of the man's, for it is with him that we first watch the screen take on the characteristics of a movie screen, and his problem of putting together a real woman with a projected image of her seems a way of describing our business as viewers. In "Pursuits of Happiness" I argue that the insistence on the identity of the female star in the films of our genre presents analogous issues for the characters and for their audience, and is a way of insisting on the cinematic status of the film we are viewing. In *It Happened One Night* a subordinate, or personal, assertion of the reality of Claudette Colbert is her stopping a car by showing her leg, one of the two most famous events in the film (the other is the companion piece of Gable removing his shirt) apart from the blanket-wall itself. When these very stockings she straightens, through which she affords this revelation (the clothes she is wearing are all she has, the rest were stolen with her suitcase), were laid by her across the top of the Walls of Jericho soon after it was first constructed, the man was stirred by the imagination of them. But now, seeing the stockings on the live woman, he is apparently left cold. Of course, the timing and the placing do not exactly set the scene of desire, even, I would imagine, for a fetishist. And yet, I think there is more to his disapproval of her gesture than an expression of anger at the spectacle she has made of herself, and more than his knowledge that her resourcefulness has in this instance outstripped his. In the succeeding shot, as they are shown being driven along, his gloominess as well as her lightness of spirit proceed as well from her having insisted, for his benefit, upon her physical identity. (I know of no one who fails to find Gable an extraordinarily charming and powerful presence in this film, even to find his intelligence and wit something of a revelation, given the way he is seen in his more explicitly adventure films. But a number of people, mostly it seems to me, women, cannot warm up to Colbert. She is sometimes found brittle, or shallow, and in any case too obscure in her emotions to warrant and satisfyingly return the attentions paid her by Gable. I have felt this, but my settled view of her in this film is that her performance, though something less than Gable's, is yet a fine match for it. It may be that Colbert lends herself to a kind of abstract view, so that one takes oneself to know what she is like without really looking at her concretely and in detail. I suggest that one make an effort to force oneself away from Gable for a moment and pay special attention to her throughout the sequence of the marriage charade and to the way she delivers her lines before and after she exhibits her leg ["I'll stop a car and I won't use my thumb," "It proves that the limb is mightier than the thumb"]. But I do not wish to insist upon this. I merely say that if you can't respond to Colbert's individuality in something like the way one responds to Gable's, this film is going to have trouble bearing the weight I place on it.)

The Lady Eve employs the most extreme device in its demonstration that acknowledging the identity of the woman requires putting two versions of her together, one in which the woman apparently plays her own twin. *It Happened One Night* employs the most economical device in its demonstration that this putting together is a spiritual task, a task of education. (This is a way of summarizing different emphases that show up between one film that declares the nature of a film screen by holding up a mirror and another that declares it by hanging up a blanket.) Both films further specify their own presence as films by suggesting that one of the pair is a surrogate for the film's director (where this role is not particularly distinguished from the film's author, if this means its screen writer). In *The Lady Eve* it is the woman who directs the action (as it is in *Bringing Up Baby*); the man is her audience, gulled and entranced as a film audience is apt to be. In *It Happened One Night* it is the man who directs, and the woman is not so much his audience as his star. The main bits of evidence for Peter as director are, of course, the events that allow us to interpret his creation of the barrier as the setting up of a screen. And we have remarked on his invention of their stagings of marriage. (I will not dwell on it, but Peter's treatment of Ellie in getting her ready to act the abused wife, the extraordinary gestures in which he musses her hair and unbuttons her blouse and rearranges her skirt at her knees, is at once a declaration of his parental powers but also of something else between them as out of the ordinary as anything in film I know of—I am at the moment calling this his direction of her.) Recall as well that in telling her of his reasons for their sharing one cabin and his insistence on following her around for her story, he has said: "And if you get tough, I'll just have to turn you over to your old man right now. Savvy? Now that's my whole plot in a nutshell. A simple story for simple people." The next morning when she says he thinks her running away is silly, he denies it, saying that it is too good a story, thus distinguishing her story from his plot, which is to force her to yield up her story "exclusive." Ellie's reply is to be considered. "You think I'm a fool and a spoiled brat. Perhaps I am, but I don't see how I can be. People who are spoiled are accustomed to having their own way. I never have. On the contrary, I've always been told what to do and how to do it and where and with whom." This is a reasonably literal description of what it is like to be a film star, and no less an accurate description of the way Peter treats her.

We have available a reading of the allegorical confusion Peter suffers in leaving Ellie while he goes to sell their story. The telling of the story is to have the effect of authorizing their marriage, of divorcing them from their pasts, she from her father and her legal husband, he from his private fantasy; of making something public. He calls it "the biggest scoop of the year." But what is the scoop, what is *their* story? He tells the editor he needs the thousand to tear down the Walls of Jericho and that her marriage is going to be annulled so that she can marry someone else, namely him. But that is *not* news, because his abandoning her means precisely that he does not know, or have it on good authority, that they can marry. He is behaving as though announcing the event in the newspaper will not only make it public but make it happen. And maybe this could work, for some story other than his own. When the editor acquires conviction in the story, from the authority of the story itself, in the face of clear evidence against it, what he says to Peter in consolation is that, with a great yarn, something always comes along and messes up the finish. This would presumably be reality. It is not Peter who has messed up the finish of the yarn; on the contrary, the only yarn is the one he has written for the editor, and the editor accepts the finish. He accepts what we have accepted. Their story has already happened; it cannot be *made* public if *this* is not public. What has made it public is a film, and in that sense a yarn. A newspaper story, coming after the fact, has no further fact to come after here. That the yarn that has happened has no assured finish in the future happiness of the pair, and is in that sense messed up, is part of the logic of the human work of construction, of art, of its transience and its permanence, as John Keats and Wallace Stevens best say; and part of the logic of the human emotion of love, what Freud calls its biphasic character; not something that this man is singularly to be blamed for.

It is notable that Peter never does transgress the barrier. When Ellie does not respond to his belated question about whether she really means what she has so passionately declared, he looks over its top, and, when he is dressed to leave, blows a kiss over it. As a man he is merely playing out the string of his confusion. Seen as a surrogate for the film's director, he is playing out the condition of film and its subjects, that their maker has to kiss them goodbye, that he or she is outside, that when the play is done his work is absolutely over, unlike the case of theater. He has become the work's audience, the viewer of creation, its first audience, but with no greater power over it therefore than any later one. He puts himself in the hands of higher powers, not unlike the duty of a romantic hero. He has accomplished his remarkable feat. His reward must be *conferred.*

I said early on that in working like a movie screen the barrier represents both an outer and inner censoring, and more recently that the man's problem in connecting the woman's body and soul, that is in putting together his perception and his imagination, his and her day and night (so that his capacity for imagination becomes his ability to imagine *her*), is a framing of the problem of other minds. Putting these notions together in turn, I would read the instruction of the barrier along these lines. What it censors is the man's knowledge of the existence of the human being "on the other side." The picture is that the existence of others is something of which we are unconscious, a piece of knowledge we repress, about which we draw a blank. This does violence to others, it separates their bodies from their souls, makes monsters of them; and presumably we do it because we feel that others are doing this violence to us. The release from this circle of vengeance is something I call acknowledgment. The form the man attempts to give acknowledgment is to tell their story. The film can be said to describe the failure of this attempt as a last attempt to substitute knowledge for acknowledgment, privacy for community, to transcend the barrier without transgressing it. Only of an infinite being is the world created with the word. As finite, you cannot achieve reciprocity with the one in view by telling your story to the whole rest of the world. You have to act in order to make things happen, night and day; and to act from within the world, within your connection with others, forgoing the wish for a place outside from which to view and to direct your fate. These are at best merely further fates. There is no place to go in order to acquire the authority of connection. The little community of love is not based on the appeal of the law nor on the approach of feeling. It is an emblem of the promise that human society contains room for both, that the game is worth the candle. You cannot wait for the perfected community to be presented. And yet, in matters of the heart, to make things happen, you must let them happen.

References

[1] I respond a little differently to Wittgenstein's observation in the Foreword to *The Claim of Reason* (New York: Oxford University Press, 1979).

[2] A reliable transcript of the dialogue, together with, instructively, a pervasively inaccurate set of descriptions and "stage directions," is in *Four-Star Scripts*, Lorraine Noble (ed.) (New York: Doubleday, Doran and Co., 1936).

[3] I claim in "Ending the Waiting Game: A Reading of *Endgame*" that Beckett achieves a new way for theater of accomplishing this point of mimesis. *Must We Mean What We Say?* (Cambridge, England: Cambridge University Press, 1976), pp. 128-30.

[4] "Pursuits of Happiness: A Reading of *The Lady Eve*," *New Literary History*, (Spring 1979): 581-601.

[5] In "The Availability of Wittgenstein's Later Philosophy," *Must We Mean What We Say?* p. 65.

[6] "Pursuits of Happiness." I offered a course jointly with William Rothman in the fall of 1978 taking off from the material I had developed about this subject of remarriage and relating it to adjacent genres in (primarily) the Hollywood constellation of genres and to other films in which the actors and directors worked who were mainly responsible for the comedy of remarriage. Beyond the many points of profit in that explicitly joint enterprise, I note here how important the conversation and the writing of William Rothman have been more generally to my thinking about film and other matters in recent years. I would also like to note my indebtedness to Norton Batkin. He and Marion Keane assisted in the course based on the comedy of remarriage, and their contributions to the discussions of the films would often make themselves felt as I pushed my readings further. I have, finally, gratefully incorporated into the present version of this essay many of the resourceful comments given me on its preceding version by Jay Cantor, Arnold Davidson, and Susan Wolf.

[7] Robert Sklar's *Movie-Made America* (New York: Vintage Books, 1976) has a good account of this event and useful references.

[8] Sigmund Freud, *Civilization and Its Discontents* (London: Hogarth Press, 1930), p. 77 note.

[9] In Dušan Makavejev's *Sweet Movie*, an account of which is contained in my essay "On Makavejev On Bergman," *Critical Inquiry*, Winter 1979: #8.

[10] Claude Lévi-Strauss, *The Elementary Structures of Kinship* (Boston: Beacon Press, 1969), p. 487.

[11] See foreword to the enlarged edition of my book *The World Viewed* (Cambridge, Mass.: Harvard University Press, 1979).

[12] See my essay "Epistemology and Tragedy: A Reading of *Othello*" in *Daedalus*, Summer 1979.

[13] Reprinted in the Signet edition of *The Tempest*, Robert Langbaum (ed.).

[14] Another observation from *The Elementary Structures of Kinship* bears on this logic. Lévi-Strauss describes a ritual of the Ifugao of the Philippines that prescribes a sham fight to be undertaken between the families of the bridegroom and the bride in order to establish that they are on different sides of the matrimonial fence, pp. 83-84.

[15] Lévi-Strauss, *The Elementary Structures of Kinship*, pp. 472, 476.

[16] It is a nice problem what this claim comes, that one feature appears "instead of" another. It

is a claim about what constitutes a genre. It picks up an idea, broached in "A Matter of Meaning It" in *Must We Mean What We Say?* and touched on in *The World Viewed*, that a narrative or dramatic genre might be thought of as a medium in the visual arts might be though of, or as a "form" in music. This idea is a shift away from conceiving of a genre as a group of things that have a set of features in common (an idea, it seems to me, that underlies certain "structuralist" writings), and rather suggests that the members of a genre share the inheritance of certain conditions or procedures of composition, and that in primary art each member of such a genre represents a study of these conditions or procedures ("limitations"?), something I think of as a bearing of the responsibility of the inheritance. In practice, this means that there is no list of features that all the instances have in common, both because nothing a priori is included or excluded as a feature until an act of criticism defines it in specific cases, and because any list must be open to the discovery or creation of further instances. This openness, however, goes in my mind with a completely closed critical responsibility, to see that any property announced as a feature of the genre either indeed holds of each instance without exception, or else that its absence in a given case can be explained by its possessing some other feature "instead of" the common one. A test of this compensation is that this feature will, in turn, contribute to a description of the genre as a whole. In the most recent case we have to take the discovery of adventurousness in a primary instance of the genre as projecting the hypothesis that a version of something we will want to call adventurousness functions in each of the other instances, as if it is the work of romance to show marriage itself as an adventure. If we are to try to think of a genre in terms of things with shared features, in my view a genre will have to be thought of as a group of things that have *all* their features in common (with the "instead of" proviso).

LEONARD B. MEYER

Exploiting Limits: Creation, Archetypes, and Style Change

Creation

FOR THE PAST THREE HUNDRED YEARS OR SO, the natural sciences have been conspicuously successful in formulating and testing theories that explain phenomena in the natural world. And they have had striking success in applying the knowledge gained through theorizing to other realms—for example, industrial, agricultural, and medical technology. As a result, the sciences have become the preferred paradigm not only for intellectual inquiry, but also for accounts of creativity, originality, and cultural change in all areas of human endeavor.

This paradigm has emphasized that the most significant and valuable achievements in the sciences have resulted from the falsification of existing theories and the promulgation of new ones based on previously unformulated concepts or unimagined relationships. Because they have become exemplary cultural heroes, the names of scientists who wrought such revolutions come readily to mind: Galileo and Kepler, Newton and Darwin, Mendel and Einstein. Whatever its validity for the sciences, this paradigm was transferred more or less intact to the arts. One result has been the assumption implicit in the title of this symposium—in the arts, as in the sciences, the creative act involves transcending limits.

Of course, much depends on what is meant by the phrase "transcending limits." But the prevalent view—which may serve as a reminder of the still-powerful presence of Romanticism in our culture—seems to be that expressed by Bronowski: "We expect artists as well as scientists to be forward-looking, to fly in the face of what is established, and to create not what is acceptable, but what will become acceptable."[1] This view, which is entirely compatible with common cultural scuttlebutt, implies that artistic change is the desirable and necessary consequence of experimentation (the scientific model is obvious) and that such experimentation results in revolutions in technical means and perhaps aesthetic ends as well. In short, what seems meant by "transcending limits" is the overturning of some prevalent style of art and the institution of a new one through a revolution comparable to those characteristic of the sciences. The conception of creativity posited by this view seems to me to be partial and strained. When applied to the arts, it is misleading and mistaken in significant ways.

It is misleading because it encourages historical distortion, for the model makes it necessary that artists acknowledged to be "great" be radical innovators. For instance, Beethoven, perhaps *the* exemplary artist, has to be seen as combining the defiant heroism of Prometheus with the conceptual boldness of Galileo: a revolutionary toppling the rules and, in so doing, freeing music from the stifling confines of convention.[2] But a sober study of his music indicates that, if his musical values are not confused with his seemingly equivocal political views, Beethoven overturned no fundamental syntactic rules. Rather, he was an incomparable strategist who *exploited* limits—the rules, forms, and conventions that he inherited from predecessors such as Haydn and Mozart, Handel and Bach—in richly inventive and strikingly original ways. In so doing, Beethoven extended the means of the Classic style. But extending is not transcending—it is not abrogating rules and overturning conventions.[3]

The association of the creative act with "transcending limits" tends to obscure a distinction of some moment, that between the historical importance of a work of art and its aesthetic significance or value. These are by no means the same. Because they initiated or strikingly exemplified a new rule or principle of organization, some works of art (or groups of works) are considered to have been of signal historical importance. Peri's *Orfeo* and the operas of the Florentine Camerata are such works. But few listeners, scholars, or critics would, I think, include these among the great works of Western music. Mozart's *Marriage of Figaro*, on the other hand, must surely be counted one of the masterpieces of world music. But its modest innovations are confined to recombining and extending existing means.[4]

A moment's reflection—an informal mental survey of familiar classics—makes it evident that there is something suspect about associating creativity with transcending limits, for few of the greatest artists have been promulgators of new principles. As Josephine Miles has observed—

> It is surprising to note, perhaps, that the so-called great poets as we recognize them are not really the innovators; but if you stop to think about it, they shouldn't be. Rather they are the sustainers, the most deeply immersed in tradition, the most fully capable of making use of the current language available to them. When they do innovate, it is within a change begun by others, already taking place.[5]

In music, the situation seems unequivocal. Though some composers have both invented new principles and devised new means for their realization, creating compositions of the highest aesthetic value—one thinks, perhaps, of the work of Monteverdi—many of those recognized as great masters have transcended no limits, promulgated no new principles. Rather they have been inventive strategists, imaginative and resourceful in exploiting and extending existing limits. This pantheon includes masters such as Josquin and Lassus, Handel and Bach, Haydn and Mozart, Schubert and Chopin, Brahms and Verdi, and even, as I hope to show in this essay, such supposed revolutionaries as Hector Berlioz.

If these observations have merit, it would seem that two different sorts of creativity—and, by extension, originality—need to be distinguished. The first kind, most clearly exemplified in the work of renowned scientists, involves the discovery and formulation of new theories that make it possible to relate different phenomena to one another in coherent ways. The second kind of creativity, that manifested in the work of many of the greatest artists, involves exploiting and extending the possibilities potential in an existing set of principles in order to make a presentational pattern.[6]

This suggests that the kinds of things created and, consequently, the modes of understanding and appreciation appropriate to each are different. Both kinds of creativity involve the use of particular phenomena and general principles, but they do so in quite opposite ways.

The kind of creativity that most often transcends limits makes use of particular phenomena observed in the natural world or in human cultures. However, instead of being of interest for their own sakes, such particulars—a falling star or a brilliant diamond, a chrysanthemum or a nesting bird, a supermarket or a Schumann symphony—are relegated to the role of data. They serve as means for the discovery, formulation, and testing of a theory. The theory, which is the goal and end result of the creative act, is a general proposition in terms of which diverse and divergent phenomena can be related to one another in coherent, understandable ways. And those theories are most highly prized, most admired, and, yes, most aesthetically satisfying that are most general, that encompass the widest range of phenomena within the simplest set of principles.

The second kind of creativity—that which exploits and extends limits, and the kind I will be concerned with in the remainder of this essay—works quite the other way around. What is created is *not* a proposition about phenomena or about the relationships among them. *Hamlet* is not a tract about the behavior of indecisive princes or the uses of political power; nor is Picasso's *Guernica* primarily a propositional statement about the Spanish Civil War or the evils of fascism. What the second kind of creativity produces is not a generalization, but a particular; not a propositional theory, but a presentational phenomenon—a specific set of relationships designed to be directly understood and experienced by culturally competent audiences.

What the second sort of creative act gives us, then, is an idiosyncratic pattern, presented in time or space: in short, a work of art. As we listen to Major General Stanley sing his song,

> And binomial theorem I am teeming with a lot of news,
> And many cheerful facts about the square in the hypotenuse,

what we enjoy and appreciate are not the binomial or Pythagorean theorems, nor the perplexing principles of prosody that constrained and guided W. S. Gilbert's choice of words. What we respond to and delight in are the deft exploitation of cultural and linguistic habits in the playful coupling of a prosaic vocabulary with high-falutin concepts and the rather preposterous extension of the conventions of rhyming.

General principles—laws, rules, and even conventions (for instance, rhymed couplets)—play an important role both in the creation of works of art and in our appreciation of them. For the artist, they constitute a set of constraints without which intelligent choice would be impossible; for the competent audience they function as the rules of the game that form the basis for understanding and evaluating the particular presentational relationships that are the work of art: for instance, the specific verbal, visual, and gestural patterning that *is* the play *Hamlet*, as actualized in some interpretation.

The implied analogy to games may serve to illuminate something about the nature of appreciation. In works of art, as well as in games, what we enjoy and respond to is not our knowledge of governing principles or rules, but the peculiar relationships discerned in a specific composition or the idiosyncratic play of a particular game. And just as our delight in the play of a particular game of football depends in crucial ways on our understanding of the constraints governing the game—the established rules, prevalent strategies, physical circumstances, and so on—so our enjoyment and evaluation of art depends on our knowledge (which may be tacit) of the constraints that governed the choices made by the artist and, hence, the relationships presented in the work of art.[7]

The analogy to games cannot, however, be sustained, and the point at which it breaks down is revealing. In games, the constraints (the rules, prevalent strategies, and so on) are explicitly known and conceptualized by all concerned—coaches, players, onlookers: "Three strikes and you're out!" "A bishop may move diagonally in either direction." In the arts, on the other hand, some of the most fundamental constraints governing aesthetic relationships may be *un*known or not be explicitly conceptualized, even by those most accomplished and imaginative in their use, that is, creative artists. They know the constraints of a style not in the sense of being able to conceptualize them or state them as propositions, but in the sense of knowing how to use them effectively. As with knowledge of a language, what is involved is the acquisition of a skill, the internalization of the constraints as unconscious modes of perception, cognition, and response. The same is true of most performers, critics, and audiences. They, too, know the constraints of a style—the laws, rules, and strategies that limited the composer's choices—in this tacit way.

What composers, performers, critics, and listeners—and, yes, musicologists—*do* know consciously and explicitly are particular realizations (often grouped into types or classes) of more general stylistic principles. And from such realizations, music theorists attempt to infer the general principles that constrained, but did not determine, the choices made by composers. As constraints have changed over time, so have the patterns that are the basis for style classifications. We readily recognize that certain melodies or harmonic progressions are characteristic of the Classic style, while others are typical of the Romantic; that this Crucifixion painting is Renaissance, another is Baroque.

There are cases, however, in which fundamental similarities of form or process transcend traditional stylistic boundaries. Some kinds of patterning seem, if not universal, at least *archetypal* within one of the major cultural traditions, such as that of Western Europe.[8] And the most patently archetypal patternings are, one suspects, those that couple compellingly coherent processive relationships with patently ordered formal plans.[9] An archetypal pattern may serve as the basis for countless individual realizations, each of which is the result of some newly devised strategy. And however modest and unprepossessing the novelty may be, it is nonetheless evidence of a creative act that exploited, but did not transcend, limits. Example of archetypes come readily to mind: quest/trial plots from Homer to Joyce; gap-fill melodies from Gregorian chant to "Somewhere Over the Rainbow."[10]

Archetypes are important because they establish fundamental frameworks in terms of which culturally competent audiences (creators and performers, critics and scholars, as well as members of the general public) perceive, comprehend, and respond to the playful ingenuity and expressive power of the idiosyncratic patterns presented in works of art.[11] They are important for other reasons as well.

Because they are coherent, orderly, and simple, archetypes are memorable and tend to be stable over time. Since they are general types, the number of archetypes is limited. For these reasons they are an important basis for stylistic learning. They are what children learn when they tediously reiterate nursery rhymes, intone tiresome chants, and make visual images that only fond parents delight in, psychiatrists regard as interesting, and Wordsworthian Romantics find profound.

Archetypes, therefore, are an important basis for cultural continuity. They are the cognitive-mnemonic schemas that Richard Dawkins called "memes," because he thought of them as the cultural counterparts of the units of biological trait-transmission.[12] Like genes, they tend to persist—but in culture rather than nature. And because they persist, archetypes may help to illuminate the nature of the changes that have occurred in the history of an art such as music. That is, using an archetype as a constant may enable us to perceive, and perhaps eventually to explain, the nature of the succession of different realizations that constitute the history of music.

It is this possibility that I plan to explore in what follows. Obviously, in an essay such as this I can do no more than discuss a few realizations of a single archetype, considering how, and perhaps why, the realizations changed over time. The relationship between the general scheme of the archetype and particular realizations of it will first be illustrated with instances from the *oeuvre* of Mozart. Then I will present an example of the way in which Beethoven realizes the archetype, and suggest the significance of some of his modifications. Finally, I will consider how Berlioz realizes the same fundamental schema, and attempt to relate the peculiarities of his actualization to what I take to be some of the significant facets of Romanticism in music.

The Archetype

Before particular realizations of the archetype are considered, the bare bones of the schema must be described and discussed, for to appreciate the similarities and differences among particular realizations, the salient features of the schema must be recognized and remembered. The basic pattern of the archetype is given in Example 1. The schema is divided into two parts, marked A and B in line *a* of Example 1. The parts are distinguished by differences in melodic pattern and by the harmonic and rhythmic closure that occurs when mobile dominant-harmony (V) resolves to stable tonic-harmony (I) at the end of Part A. In particular realizations, moreover, contrasts in texture (for instance, accompaniment figure) and dynamics often serve to emphasize the distinction between parts.

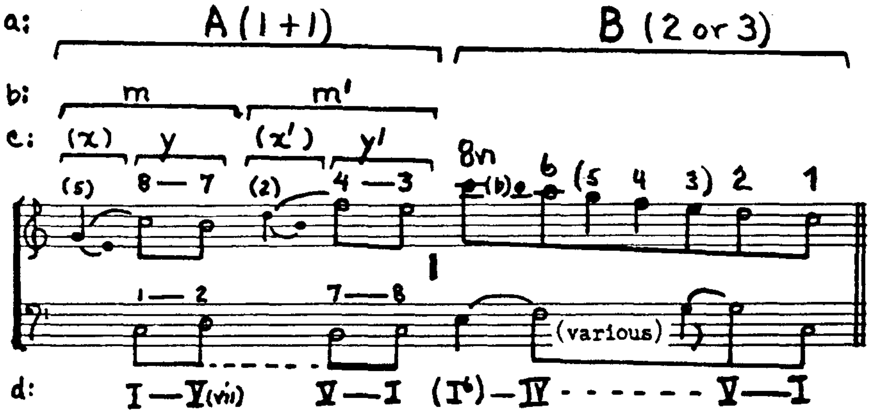
In the instances that I have come across, this scheme may be the basis for the patterning of a whole theme or parts of it. In the latter case, the archetype may structure both parts of a larger melody—as in an antecedent-consequent period

(A-A′); or the archetype may, as we shall see, structure only one part (usually the first) of a higher-level binary form (A-B).

Part A itself consists of two melodic/rhythmic entities, designated *m* and *m′* on line *b*. These are always similar in melodic contour and in rhythmic pattern.[13] As a result of this similarity, the morphology of the first part of the archetype is always in the proportion (1 + 1). The length of the second part is more variable; but as a rule, it is either equal to, or half again as long as, the first part. The whole pattern, then, is generally in the proportion (1 + 1) + 2 or (1 + 1) + 3.

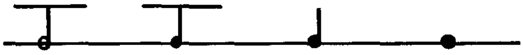
The patterns *m* and *m′* may themselves be subdivided into motives *x* and *y*, and *x′* and *y′*, but as the parentheses (on line *c*) indicate, motive *x* is not invariably present. When it is, it usually centers around the fifth degree of the scale (5); at times, the third of the scale (3) is also part of the patterning of *x*; when *x′* is present, it usually centers on the second degree of the scale (2) and perhaps touches the seventh (7) as well.[14] Thus, though its presence may be characteristic, motive *x* does not define the first part of the archetype.

What defines the archetype are the melodic and harmonic relationships between *y* and *y′*. As indicated in Example 1, *y* consists of a melodic motion from the tonic (1 or 8) to the seventh degree of the scale, accompanied by a harmonic progression from the tonic triad (I) to a chord built on the dominant (V), or some substitute for it (vii); *y′* consists of a melodic motion from the fourth degree of the scale (4) to the third (3), harmonized by a progression from the



Note: The notation used in the analyses does *not* represent the duration of the stipulated pitches, but only their relative structural importance and their constancy as features of the archetype. These are notated as follows:

most important ——→ least important



Example 1

dominant (or a substitute) back to the tonic.[15] Though what is crucial is its harmonic function, the melodic contour of the bass is usually the opposite of that of the melody: that is, when the melody descends, the bass ascends and vice versa. The most common bass pattern is that shown in the example: namely, 1 - 2 : 7 - 8.[16]

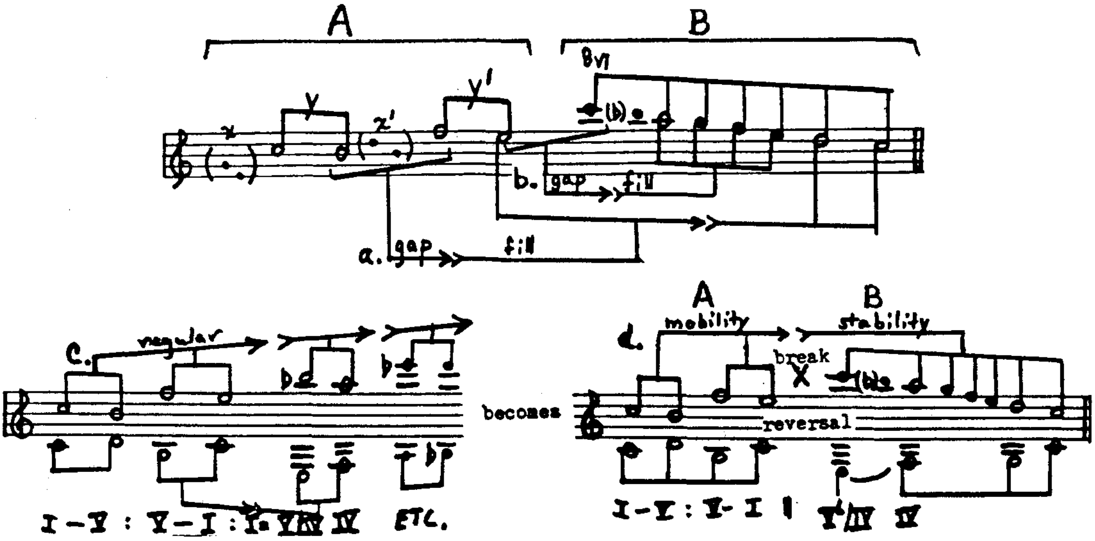
Part B of the archetype is considerably more variable in form and process than Part A. Melodically, it usually begins with the upper octave of the tonic, marked "8v" in Example 1. This note, which will be called the "upper tonic," is often harmonized by the first inversion of the tonic triad (I^6). The first important structural pitch, however, is usually the sixth degree of the scale, accompanied by subdominant harmony (IV or ii^6). Melodically, what most often follows is stepwise descending motion through the fifth, fourth, and third of the scale—with various possible harmonizations—to the second degree, harmonized by a dominant triad. This is resolved to the first degree of the scale harmonized by the tonic triad.

Conjunct descending motion is not, however, the only possible melodic patterning. To understand why this is so, we must consider the kinds of processes generated by motives *y* and *y′*. One of these is what I have called a "gap-fill" process.[17] When a skip occurs in a melodic pattern, we are aware, though perhaps unconsciously so, that some of the steps of the scale have been "left out." The sense of incompleteness created by such a gap implies a subsequent fill—a stepwise melodic motion that creates a sense of completeness by presenting the pitches previously skipped over.[18] And though ascending gaps are most often followed by descending fills, all or part of a fill may, as we shall see, consist of rising motion.

For the sake of later discussion, it is important to analyze the processes characteristic of the archetype in a bit more detail. Because *y* and *y′* are intervallically identical (each descends a half step) and are usually alike in metric placement, duration, and so on, we relate them to *each other* despite the fact that a different motive, *x′*, may have come between them. Thus the skip from the end of motive *y* to the beginning of *y′* is understood as a gap implying conjunct fill.[19] As graph *a* of Example 2 shows, the fill begins when the fourth degree of the scale moves to the third at the close of motive *y′*. Further motion, through the second degree to the tonic, is, of course, implied. But such continuation is delayed until the end of the archetypal scheme. It is delayed because a second process, generated by the relationship between *y* and *y′*, creates a further gap. This process is "sequential." The sequence consists of motive *y* and its repetition a perfect fourth higher (*y′*). This regularity implies continuation. And had the sequence been continued exactly, it would have been as shown in graph *c* of Example 2. The harmony, too, would have moved sequentially, as shown beneath graph *c*, to the subdominant—and perhaps beyond.

However, though the subdominant is characteristically the first structural harmony of Part B (see graph *d*), the sequence is broken. For instead of skipping in exact sequence to B-flat, *y′* is followed by a skip to the upper tonic. What remains of the sequential process is the structurally important motion to the sixth degree of the scale, harmonized by the subdominant.

The skip from the third of the scale to the upper tonic creates a second gap. But, as graph *b* indicates, the fill really begins with the sixth of the scale and descends to the third. Only then is the process generated by the first gap (graph *a*) completed by a fill that reaches the tonic.

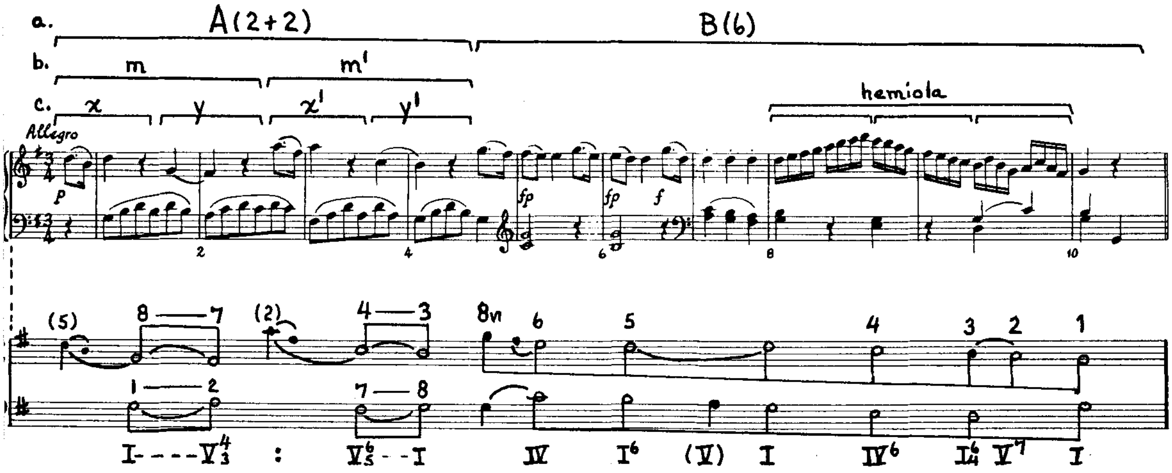


Example 2

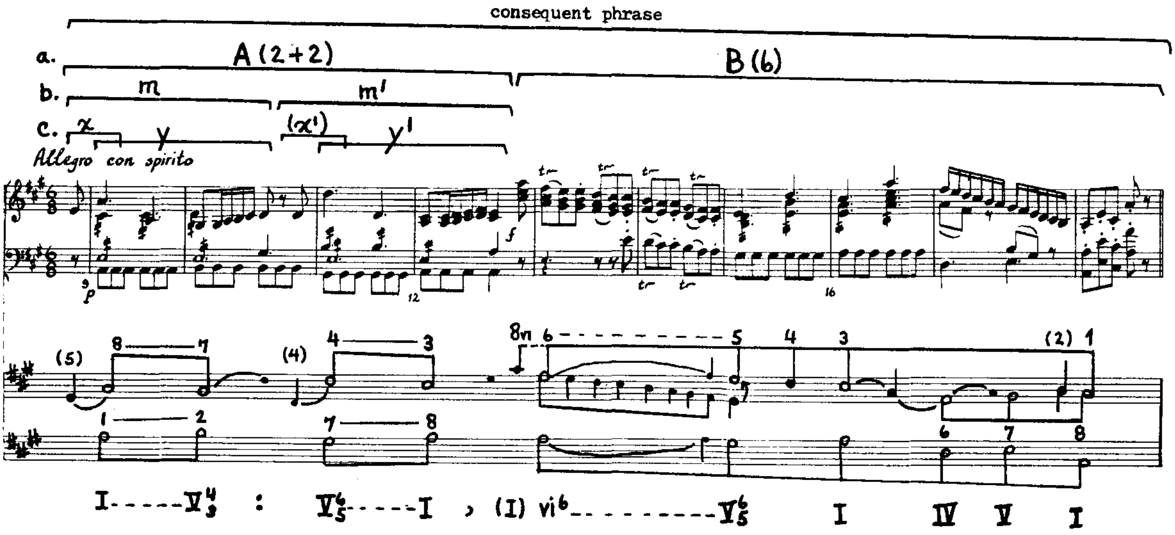
From a syntactic point of view, the second part of the archetype complements the first. In Part B, that is, the implications generated in Part A are realized through the filling of melodic gaps, the curbing of harmonic expansion, and a general emphasis on stability. This "reversal" from the relative tension and uncertainty of ongoing mobility, present in Part A of the scheme, to the relative relaxation and certainty of arrival and provisional closure, characteristic of Part B, constitutes what I shall call the syntactic climax of the archetypal structure.[20]

Let us consider three instances of the archetype as they occur in the *oeuvre* of Mozart. The first instance (Example 3) is the beginning of the first movement of the Piano Sonata in G Major (K. 283). The theme exhibits almost all of the features said to be characteristic of the archetype. Its two parts are clearly differentiated by motivic pattern, direction of melodic motion, accompaniment figure, and dynamics. The structural lengths are (2 + 2) + 6. Though motive *x* and *x'* are unusually well-defined and discrete, lack of harmonic motion within them makes their subsidiary nature clear. The sequential gap-fill motion from *y* to *y'* is patent, as is the arrival at the upper tonic—though the high G is harmonized by a root position triad rather than one in first inversion. As indicated in the analytic graphs, the bass motion and harmonic progression are typical.[21]

The second instance, Example 4, is from the opening theme of the last movement of Symphony No. 29 in A Major (K. 201). The archetypal scheme structures both parts of an antecedent-consequent period—but only the consequent period will be considered here. In this instance, motive *x* consists of a single pitch, the fifth of the scale, which functions as an upbeat to motive *y*. As a result, *x* virtually loses its identity as a motive. Motive *x′*, which is differentiated only rhythmically, is essentially absorbed into motive *y′*. Although subject to octave transfers, motive *y* and *y′* move unequivocally through the typical pattern (8-7, 4-3) accompanied by the usual harmonic progression and changing-note figure in the bass. Particularly in the consequent phrase, the conjunct descending fill as well as the contrast in rhythm, dynamics, and register differentiate the second part of the archetype from the first.[22]

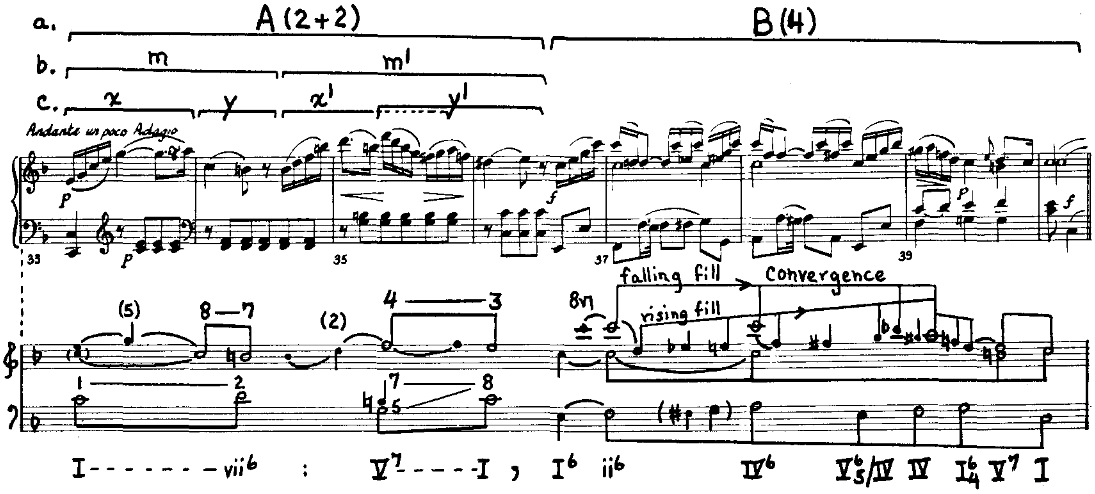

a.
A(2+2)
B(6)
b.
m
m'
c.
x
y
x'
y'
hemiola
Allegro
p
fp
fp
f
2
4
6
8
10
(5)
8—7
(2)
4—3
8va
6
5
4
3
2
1
1—2
7—8
I- - - -V$^4_3$: V$^6_5$- - I IV I^6 (V) I IV^6 I$^6_4$ V^7 I

Example 3


consequent phrase
a.
A (2+2)
B (6)
b.
m
m'
c.
x
y
(x')
y'
Allegro con spirito
tr
p
f
9
12
16
(5)
8—7
(4)
4—3
8va
6 - - - - - - - - - 5
4
3
(2) 1
1—2
7—8
6
7
8
I- - - - -V$^4_3$: V$^6_5$- - - - I , (I) vi^6- - - - - - - - - -V$^6_5$ I IV V I

Example 4

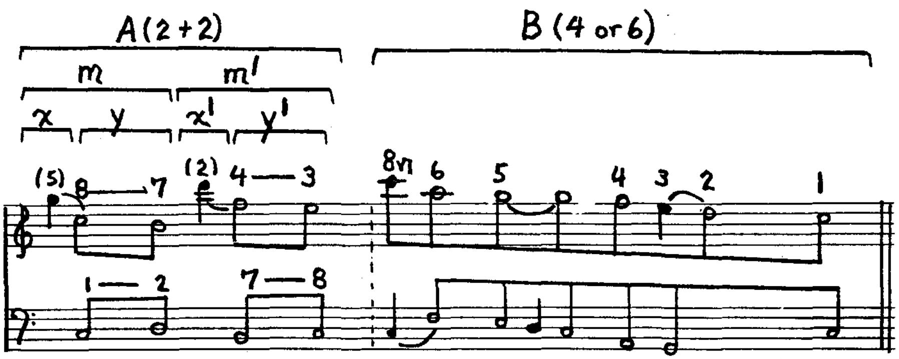
Example 5 is the first C Major section from the second movement of the Piano Sonata in C Major (K. 309). In this instance, *x* and *x'* are at least as patently shaped as *y* and *y'*. As in the archetypal model, the fifth is the most prominent tone in *x*, while the second of the scale is so in *x'*. Despite their relative brevity, there is no doubt that the cadential progression implicit in *y* and *y'* articulates the form and generates the process that structures this melody. Though the bass moves to the fifth in measure 35, the leading tone is present, and the harmonic progression is characteristic.



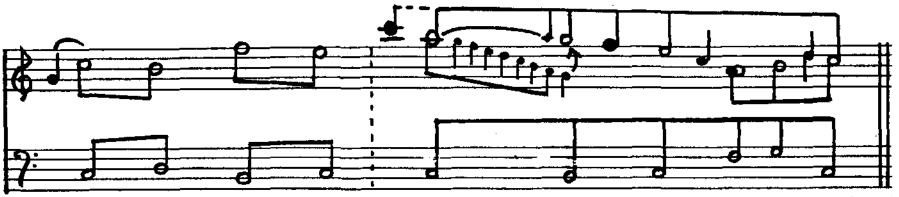
Example 5

Part B begins with the customary progression from I^6 to the subdominant (ii^6). But, instead of descending, the upper tonic is reiterated, while rising motion in a lower line begins the fill. As the analysis shows, the upper tonic ultimately descends as both lines converge on the sixth of the scale, the A in measure 39. Such emphasis is entirely appropriate, not only because A is typically a focal point in the archetypal scheme, but also because it begins the last in a series of conventional patternings suggesting closure[23]—a fact that will be important when the instance from Berlioz's music is considered.

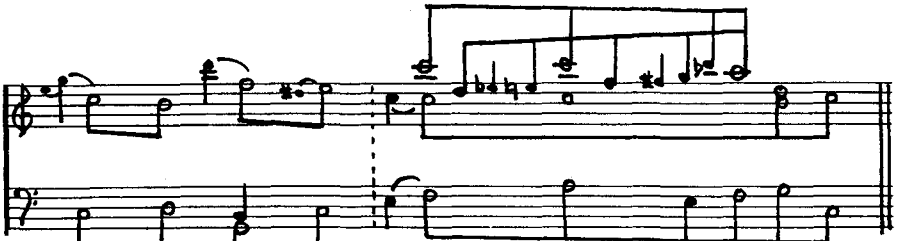
Analyses abstracted from Mozart's realizations of the archetype are given in Example 6. For convenient comparison, all analyses are given in the key of C. The family resemblance is inescapable, though the realizations differ markedly in aural patterning—in foreground melody and rhythm, harmony and texture, meter and tempo. Faced with such underlying commonality, one cannot fail to ask what limits Mozart is here transcending. The answer, of course, is none. Rather, it is his genius to exploit his, and our, familiarity with the constraints, (the limits) of the classic style.



(Example 3)



(Example 4)



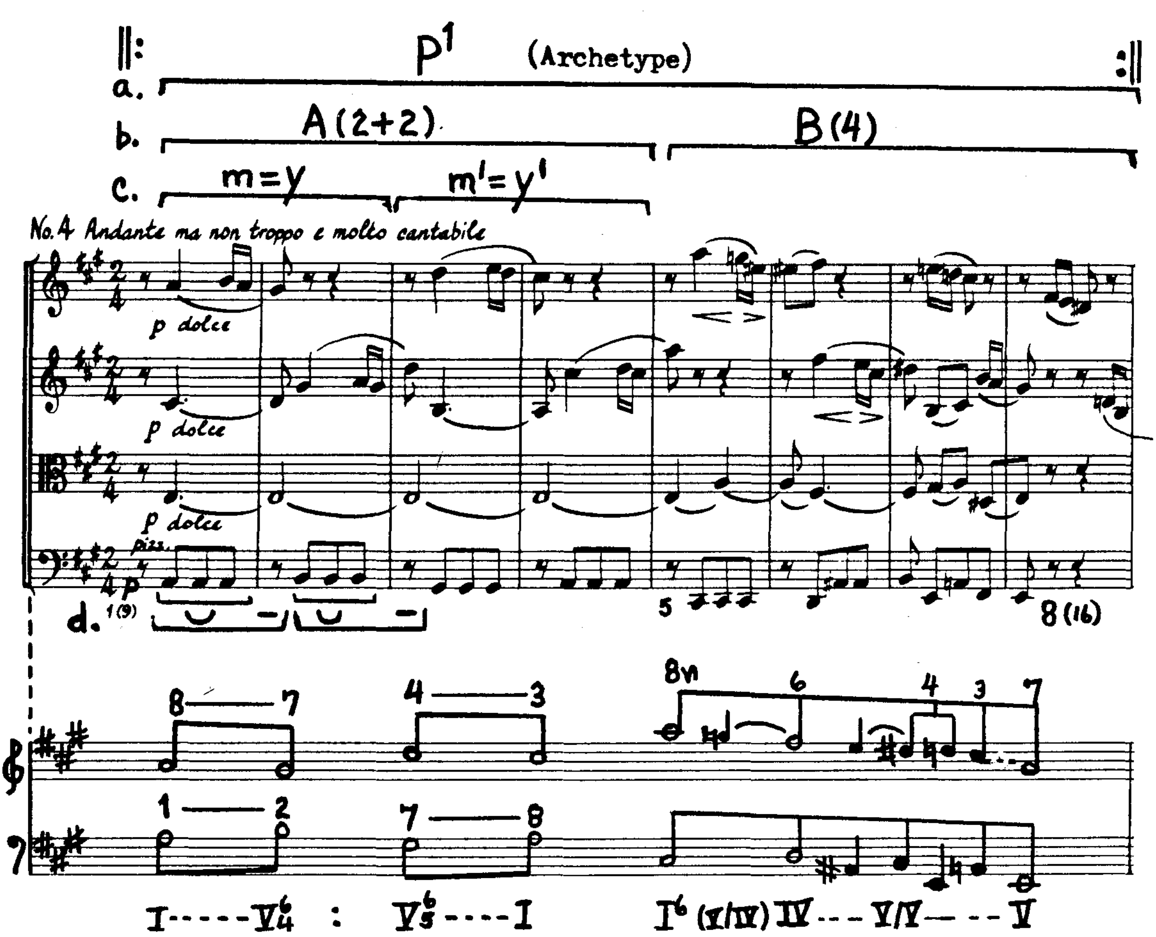
(Example 5)

Example 6[24]

Style Change

All of the preceding instances were composed during the 1770s. Now I shall discuss two instances of the archetype taken from works written more than forty years later. The first, one of the last works of the Classic style, was written by Beethoven in 1826; the second, one of the exemplary works of the Romantic style, was written by Berlioz in 1830.

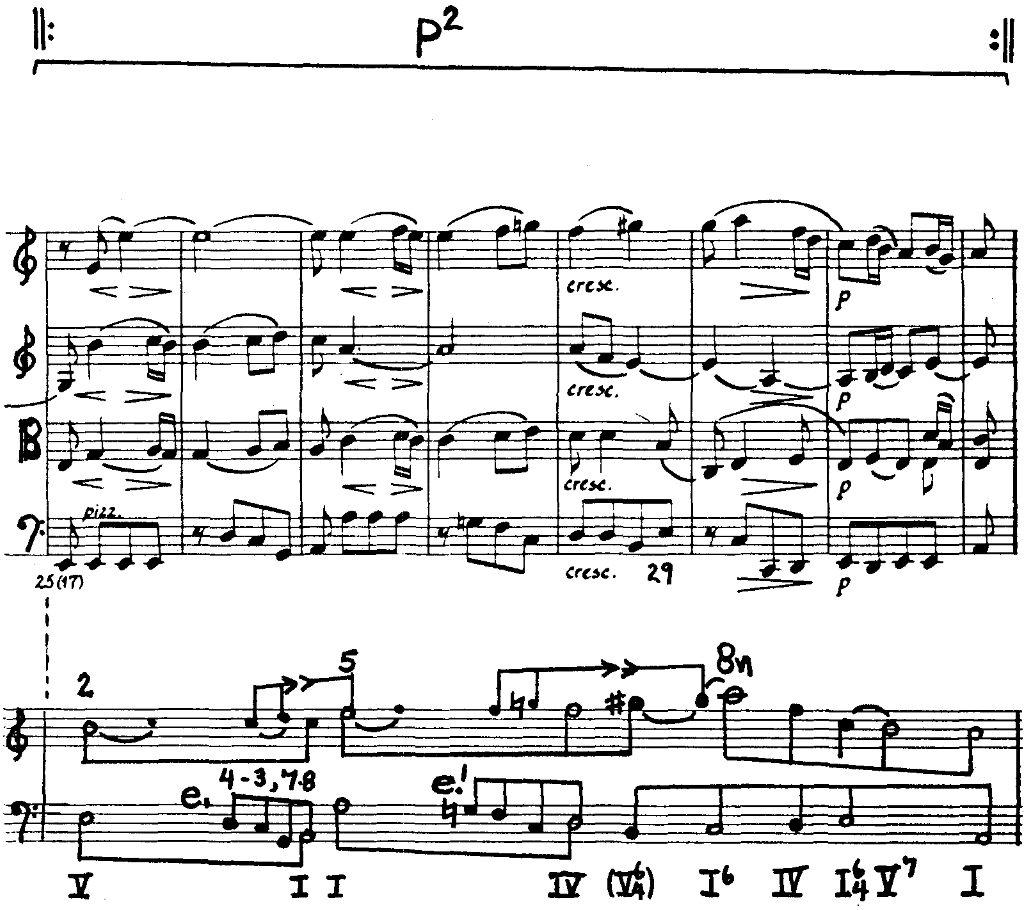
The work from Beethoven's *oeuvre* (Example 7) is the theme of the fourth movement of the String Quartet in C-Sharp Minor, Opus 131. The theme is in two periods (labeled P^1 and P^2 in the example); each of the periods is repeated in somewhat varied form.[25] The first period (P^1), an antecedentlike phrase, presents a version of the archetype. And Part A is an almost pristine distillation of the pattern—with no trace of an *x*-motive and no hint of harmonic elaboration.[26] Part B of the archetype begins typically with the upper tonic over first-inversion tonic harmony. The melody then descends linearly, developing con-



Example 7

siderable mobility as the result of a harmonic sequence that, following emphasis on subdominant harmony, closes on the dominant (m. 8 and 16).

Instead of a "proper" consequent phrase, however, what follows is a new sequence that, while maintaining the rhythmic figure established in P¹, moves from the second degree of the scale (B) back to the upper tonic.[27] (It is as though the fill of the second part of the archetype was not entirely satisfactory. In "compensation," the ascending line of the second period emphasizes the second and fifth of the scale, important tones touched only lightly (m. 7) in the descending fill of the first period.) In contrast to the first period, the rising sequence of the second makes reaching the upper tonic seem a more significant achievement. This is so for several reasons. First, rising lines generally engender a greater sense of effort than do falling ones. And this sense tends to be specially strong when the rising line is not only sequential, but what might be called "Sisyphean"—that is, when the motive, which is the basis for the sequence, itself rises (implying continued upward motion), only to fall back.[28] And the force of such upward goal-directed motion is heightened by the growth and decay of dynamics within measures 25 and 27. At measure 29 the sequence ends as the rising line moves directly to the high A. Again dynamics—the



crescendo in measures 29 to 30—help to heighten the sense of ascending motion, while the expansion of registral sonority (in the middle voices) and the appoggiatura, G-sharp, strongly stress the arrival of the A. Once this goal is achieved, dynamics die away, register and sonority return to normal, and the melodic line descends toward closure on the tonic.

This description calls attention to a distinction of importance, that between syntactic climax and statistical climax. A *syntactic climax* is a result of what was earlier called reversal: that is, a change in which forms and processes shaped by the primary parameters of melody, rhythm, and harmony move from a state characterized by relative mobility, ambiguity, uniformity, or irregularity, to one of relative stability, coherent process, and clear form. A *statistical climax*, or "apotheosis," on the other hand, consists of a gradual increase in the intensity of the more physical attributes of sound, the arrival at a tensional "highpoint," followed by a usually rapid decline in activity—a falling-away to quiet and closure. Because the intensity of the secondary parameters that shape such processes can be measured and quantified—for example, the increase or decrease in dynamics (intensity), in pitch (as frequency), rate of note succession, timbre, and tempo—they have been called statistical. One further point: though an intensification of secondary parameters—higher pitches, louder dynamics, and so on—often accompanies syntactic climax, such heightened activity is not a necessary condition for—but a concomitant, a symptom, of—such climax.[29] In a statistical climax, however, the highpoint of activity *is* the central tensional event—which either subsides to closure or "resolves" into a forthright affirmative musical assertion.

Returning now to Beethoven's theme, both periods are shaped by syntax, but in the second (P^2), the syntactic climax in measures 29-30 is led up to and complemented by features characteristic of statistical climax: the gradual increase in intensity that results from the sequential rise, the crescendo, and the enlargement of registral sonority, all followed by a quick decline in intensity. This interpretation is supported by another difference between the first and second periods of the theme. Instead of occurring halfway through, as in the first period, the highpoint now occurs in the sixth measure—three-fourths of the way through. For reasons that I will present later, such placement nearer to the end of a process is characteristic of the highpoint of a statistical apotheosis.[30]

The final actualization of the archetype that I will consider is the main melody, the famous *idée fixe*, from the first movement of Berlioz's *Symphony Fantastique* (Example 8). The work was written only four years after Beethoven's C-Sharp Minor Quartet, but Berlioz was Beethoven's junior by more than thirty years, and thus the difference in style is very striking.[31]

Despite significant differences, however, salient features of the archetype are unquestionably present. In what follows I will first show that Berlioz's melody is, in fact, a member of the class I have been describing. Then I will consider how and why Berlioz has modified the archetypal scheme, and attempt to relate such changes to what I take to be some of the leading currents of Romanticism in music.

That Berlioz's melody is a member of the archetypal class I have described seems indisputable—though not necessarily obvious. As the analysis given in Example 8 shows, the first part of the melody is divided into two long phrases that are comparable to those designated as m and m' in the archetypal scheme. Each phrase begins with a triadic pattern that prolongs a single harmony: these are the x motives. As in the instances already considered, motive x centers on the fifth of the scale (G), motive x' on the second degree (D). Typically, the first phrase (m) closes with a motive (here labeled y^a) that descends a halfstep from the tonic (C) to the leading tone (B); and the second phrase (m') also closes with a descending halfstep (labeled y^b) that moves from the fourth of the scale (F) to the third (E). As in previous instances, the underlying harmonic plan is I—V : V—I.[32]

Berlioz's melody is certainly in agreement with my earlier observation that the second part of the archetype allows for greater variability than the first. Instead of beginning with the usual skip to the upper tonic, thus continuing the sequential gap process begun in Part A, the second part of the *idée fixe* (labeled B^1) first reaches the upper tonic (the C in measure 99) through a new linear sequence based on a motive (labeled *ss*) that was initially presented between motives x and y^a. In a sense, this first upper tonic occurs as part of the wrong sequence. Moreover, it is a mobile dissonance—an appoggiatura that calls for resolution. But in the archetypal scheme, and in all the instances of it presented, the upper tonic was relatively stable; usually, it was part of the tonic triad.

A satisfactory upper tonic does occur at the beginning of the last part of the melody (B^2). Harmonized, as it often is, by the first inversion of the tonic chord, the stable high C (m. 103) moves in familiar fashion to the sixth of the scale (m. 105). As in the second part of the instances already discussed, the remainder of B^2 descends to closure on the lower tonic. As shown in graphs G^1 and G^2, gaps generated earlier—from y^a to y^b, and from y^{b-3} to the high C (m. 103)—are filled by gradual descending motion. At the same time the fill also accommodates a succession of closing figures.

Though I do not doubt that the archetypal patterning is central to the form and process of Berlioz's melody, the need to argue the case at all suggests that salient features of the archetype have been obscured. The question is not only *why* the lineaments of the scheme have been veiled, but also *how* the particular changes made are related to the presumed need for disguise.

In my view, Berlioz's exploitation and extension of the archetype can be interpreted as an exemplary and revealing response to two of the beliefs central to Romanticism. The first is the belief that conventions, whether in human behavior or in the realm of art, are not merely deplorable, but are also somehow decadent and immoral. Habitually denigrated and disparaged as being impersonal formulae, calculated contrivances, or lifeless clichés, conventions were at the very least considered to be symptomatic of the detested fetters that, according to Rousseau, enchain mankind.

A number of different beliefs and attitudes characteristic of Romanticism can be related to one another through their common incompatibility with the conventional as it was understood at the time. The following are examples of attitudes toward the conventional that have a connection with the arts:

1. The personal expression of the artist-as-individual, assigned a position of prime importance in the aesthetics of Romanticism, could not easily be reconciled with the apparent impersonality and commonality of prevalent convention. Also, the artist's role as "revolutionary liberator," still with us here today, called on him to overturn rules and conventions—to transcend limits.

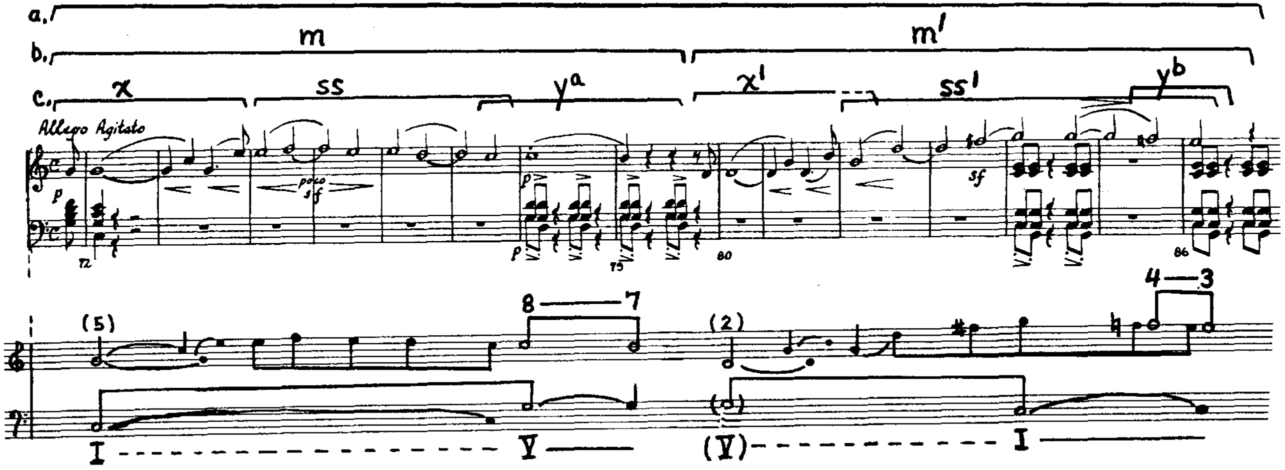
2. Inspiration, regarded with almost religious awe by devout Romantics, seemed diametrically opposed to convention. Far from being learned and culturally shared, as conventions were, inspiration was supposed to flow spontaneously from the artist's inmost being, as natural and unpremeditated art.

3. The perspicacity imputed to innocent infants (trailing their glorious clouds behind them) and the virtue patronizingly attributed to the uncorrupted honesty of presumably uncultivated primitives—these, too, testify to the low esteem in which culturally learned conventions were generally held.

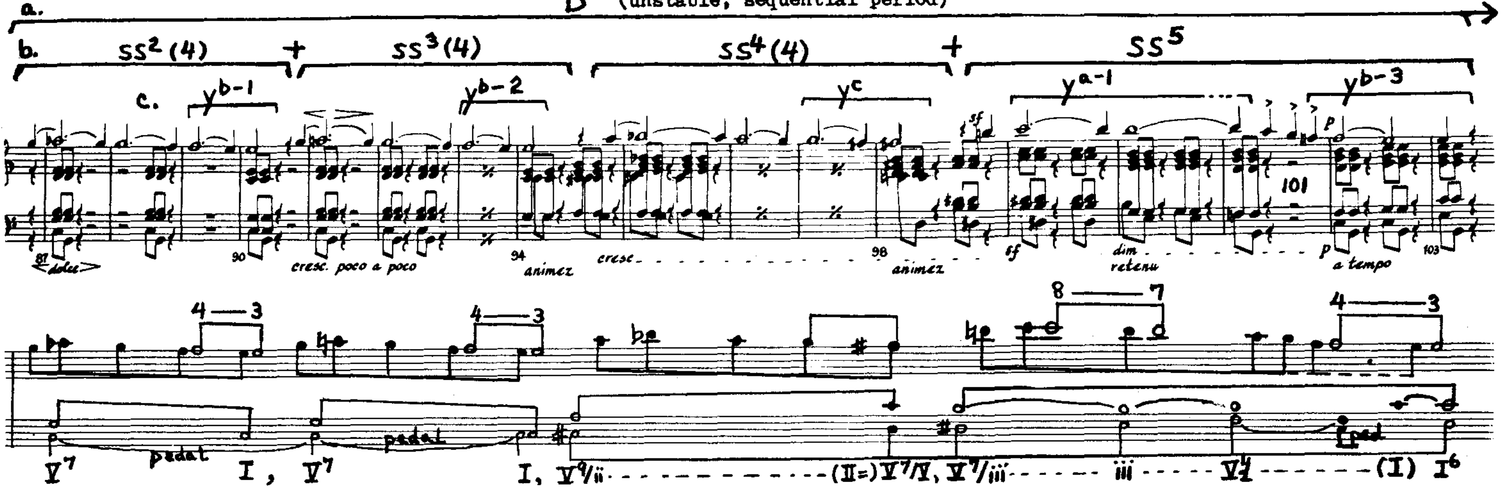
4. The magical power of such Romantic heros as Siegfried and Parsifal is intimately connected with their cultural innocence—with the fact that they had not been defiled by the conventions of civilization.

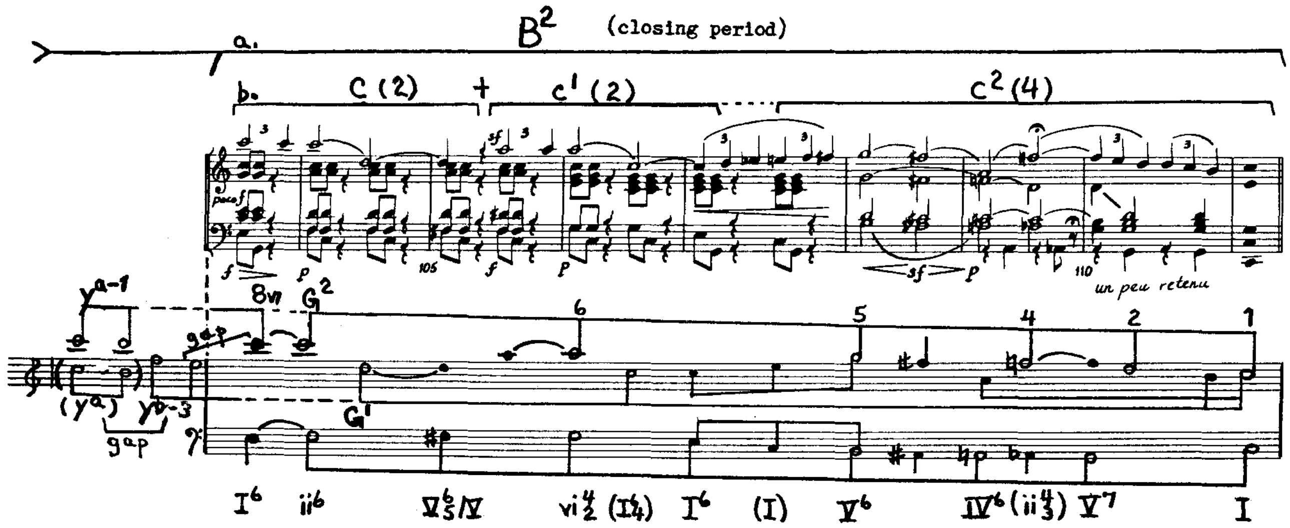
As Charles Rosen and Henry Zerner point out, one of the deepest ambitions of Romantic artists was "the achievement of 'immediacy,' of forms of expression directly understandable without convention and without previous knowledge of tradition."[33]

A (8+7)


a.
b. m m'
c. x ss y^a x' ss' y^b
Allegro Agitato
p poco sf sf p
72 75 80 86
(5) 8—7 (2) 4—3
I V (V) I

B¹ (unstable, sequential period)


a.
b. ss²(4) + ss³(4) ss⁴(4) + ss⁵
c. y^b-1 y^b-2 y^c y^a-1 y^b-3
87 dolce 90 cresc. poco a poco 94 animez cresc. 98 animez sf dim. retenu p a tempo 101 103
4—3 4—3 8—7 4—3
V⁷ pedal I, V⁷ pedal I, V⁹/ii (II=)V⁷/V, V⁷/iii iii VI⁴ ped (I) I⁶


B2 (closing period)
a.
b.
C (2)
+
c1 (2)
c2 (4)
poco f
f
p
sf
105
110
un peu retenu
ya-1
(ya)
yb-3
gap
gap
8vi
G2
G1
6
5
4
2
1
I6
ii6
V6/5/V
vi4/2 (I6/4)
I6
(I)
V6
IV6 (ii4/3) V7
I

Example 8

Thus arises what I take to be a problem of signal importance for the history of music in the nineteenth century. From an ideological, conceptual point of view, the conventional, the formulaic, the archetypal is anathema—something strenuously to be shunned. But from a practical point of view, those who compose tonal music cannot do without conventions of grammar and syntax and the archetypal schemas that make relational richness possible.[34] While this dilemma was not satisfactorily resolved during the nineteenth century, a workable arrangement was reached.[35] Conventions, formulae, and archetypes were permitted in this arrangement, but they were to be veiled or disguised in some way. In music, one of the discoveries of Romanticism was how to hide your archetype and have it too!

A second belief central to Romanticism is a corollary of the deprecation of convention. It affirms the excellence and value of what is natural—of spontaneous action, unreflecting feeling, untutored genius, and informal, unarranged landscapes. This enthusiasm, at times reverence, for the natural can be related to an important characteristic of nineteenth century music: that is, the increasingly important role played by secondary parameters in the shaping of musical process and the articulation of musical form.

To understand this relationship it is necessary to recognize that the secondary parameters are, perhaps paradoxically, a more "natural" means for shaping musical processes and articulating musical forms than are the primary ones. For instance, the ritard and diminuendo, the thinning of texture, and the descending succession of pitches in measures 100 to 103 of Berlioz's melody all seem to foster and presage closure—even without help of the articulation created by melody, harmony, and rhythm. This is because the physical patterning of the sound continuum—of pitch frequency, concord and discord, dynamic intensity, rate of impulse, instrumental timbre, and so on—shapes states of tension and repose in an almost unmediated, direct way. However, the subtle, equivocal closure created (in the same measures) by the relationships among melody, harmony, and rhythm can be comprehended and experienced only by those who have internalized the constraints—have learned the conventions—of the style of tonal music.[36] Partly because they seemed more "natural," and hence compatible, with the prevailing ideology, secondary parameters became more and more important during the course of the nineteenth century. Complementing the increased importance of the secondary parameters in shaping music was a decline in the importance of large-scale tonal relationships created by the primary parameters.

A corollary of this change in emphasis was an increase in the importance of statistical climax, or apotheosis, relative to syntactic climax in the shaping of musical structure—until the former comes to overshadow the latter. Such statistical highpoints generally occur quite late in a form: roughly two-thirds rather than half the way through, as is commonly the case with syntactic climax. The reasons for this appear to be more or less as follows.

A syntactic climax need not, and usually does not, lead directly to closure. The reversal that articulates the climax is from a situation characterized by tonal ambiguity, unpredictability of uniform processes and weakened shapes, and uncertain formal organization, to one of secure tonal/harmonic orientation, strongly shaped patterns, and clear, formal organization. But tonal/harmonic processes may be coherent without being closed; patterns may be patently shaped, though some implications remain to be realized; and formal organization may be clear without formal structure being complete.[37] Because syntactic climax need not be directly followed by closure, it can occur as early as halfway through formal entity—as it does, for instance, in Mozart's realizations of the archetype.

The highpoint in any statistical climax, however, usually occurs fairly late in the pattern. Otherwise the falling-off toward closure, unsustained by syntax, will be too long, and boredom will ensue. The only way to "prolong" an apotheosis process is to begin a new buildup as the earlier one is subsiding. From this building up again and again arises the cumulative wave-form pattern quite common in the music of the nineteenth century. In fact, it was a miniature version of such a wave-form pattern that was earlier called a Sisyphean sequence. And this brings us back to Berlioz's melody.

One of the obvious differences between Berlioz's melody and the instances considered earlier is that it is four times longer. Thus motive *m*, which was two-measures long in all of the earlier instances, lasts for eight measures in Berlioz's theme.[38] This increase in magnitude, itself a characteristic of much Romantic music (particularly that for orchestra), acts both directly and indirectly to obscure the archetypal pattern. It obscures directly because the change in size increases the *absolute* temporal distance between the pattern-generating motives, y^a and y^b, making it more difficult for the listener to connect them. Indirectly, and more important, the change in size involves a change in structure, both within and between the parts of the archetype. The nature of the relationship of size to structure in music is at once of central importance for the history of music and still highly problematic. I can only suggest that D'Arcy Thompson's observations about the interdependency of size and structure in the natural world hold, with appropriate modifications, in the worlds of human culture. And just as one cannot simply increase the size of, say, a mosquito tenfold and still keep its functions and activities constant, so one cannot merely augment a musical pattern fourfold and yet maintain its functional relationships.[39]

From this point of view, seeing how Berlioz modified the archetype by amplifying (and thereby disguising) it may serve to illustrate some of the compositional problems of nineteenth century music. Phrases *m* and *m′* of Part A of the archetypal model are enlarged through both augmentation and addition. The model's motives *x* and *y* are augmented: each is two-measures, instead of one-measure, long. What is added is a new motive not previously encountered in instances of the archetype, labeled *ss*, for Sisyphean sequence. In internal construction it rises only to fall, and from phrase to phrase it is the basis for an ascending sequence. Motives *ss* and ss^1 tend to obscure the relationship between y^a and y^b (so fundamental for an understanding of the archetypal pattern) for three reasons. First, they add another item to be remembered. Second, it is unclear precisely where *ss* and ss^1 end and y^a and y^b begin. Finally, the relationship between y^a and y^b is weakened by the lack of parallel rhythmic patterning and by the shortening of y^b by one measure.

Harmonic usage also serves to disguise the archetype. Because dominant harmony (V) ends the first phrase *(m)*, and occurs as part of motive *x′*, it is understood to underlie the beginning of the second phrase *(m')*.[40] There is a resolution to tonic harmony in measure 84, but the context is wrong, as is the timing (see symbols under analytic graphs).[41] Had the sense of dominant harmony persisted, the archetypal patterning

$$\frac{y^a}{\text{I - V}} : \frac{y^b}{\text{V - I}}$$

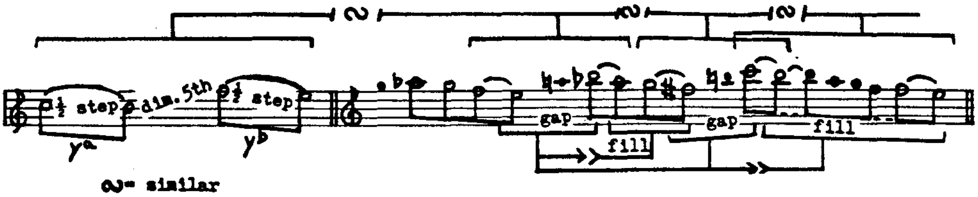
would have been more patent. But Berlioz subverted what might have been an unambiguous authentic cadence (V-I), probably because he sought to avoid even the slightest hint of the formulaic and the routine.

His distaste for the formulaic and the conventional—including authentic cadences—is evident throughout his writings, as these excerpts from his memoirs indicate:[42]

> the appalling quantity of *platitudes* for which the piano is daily responsible; the *lure of conventional* sonorities (p. 41); hence those convenient vocal *formulas* . . . that eternal *device* of the final [authentic] cadence (p. 212); the deadliest enemies of genius are those lost souls who worship at the *temple of Routine* (p. 218); those *perfect cadences, recurring every minute,* account by themselves for some two-thirds of the score . . . [Cimarosa's] *Secret Marriage* is an opera fit only for fairs and carnivals (p. 317). *(italics added)*

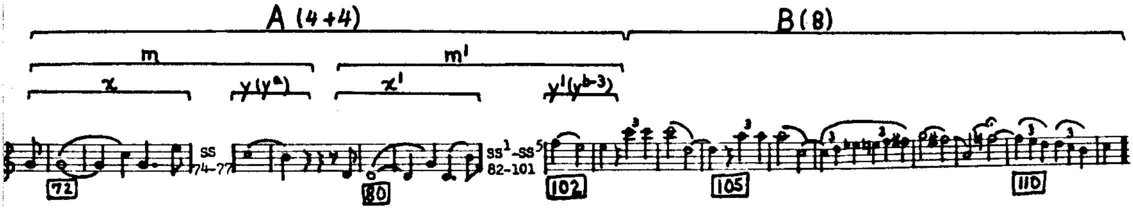
This antipathy toward the conventional may help to explain why the force of other authentic cadences in this theme is enervated by tonic pedals (mm. 88-90, 93-94, 102-103), dissipated by silence (m. 89), and weakened by voice-leading (mm. 102-103). In fact, there is only *one* unambiguous, conventional authentic cadence in the forty measures of Berlioz's *idée fixe*, the one at the very end.

The next part (B^1) of Berlioz's melody is related to, yet independent of, the archetypal pattern. It is related to the pattern motivically. As if to compensate for the weak closure of y^b (and perhaps its shortened length as well), phrases ss^2 and ss^3 (each a normal four-measures long) end with reiterations of motive y^b; in the second of these (m. 93-94), no rest in the accompaniment weakens the connection between dominant and tonic.[43] More important, the essential intervallic structure of the first part of the archetype seems to guide the sequential progression. As Example 9 shows, the motion from one level of the sequence to the next involves the same intervallic pattern—that is, down a semitone, up a diminished fifth, and down a semitone—as is characteristic of the progression from y^a to y^b.[44]



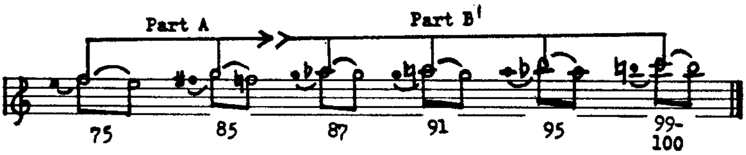
Example 9

Two considerations suggest, however, that though the second part (B^1) capitalizes on relationships borrowed from the archetype, it is essentially independent of the archetype. First, the similarity between the closes of Parts A (mm. 85-86) and B^1 (mm. 102-103) makes it clear that virtually nothing has happened. In terms of the processes generated by the archetypal pattern in the first period, we are literally, as well as figuratively, back at *Chord I.* Second, as was noted in the discussion of Part A, motive *ss* extends, and thereby obscures, archetypal relationships, but it does not alter them. And since part B^1 is based almost entirely on motive *ss*, it seems that it can, for purposes of analysis, be considered independent of the archetypal process. That this suggestion is not entirely implausible can be shown by an analytic experiment. If all traces of motive *ss* are removed from Berlioz's melody, and if measures 102 and 103 are substituted for measure 86 (which is not unreasonable, since they are equivalent), then the "melody" would be as shown in Example 10. And this pattern is not unlike that of, say, the second movement of Mozart's Piano Sonata in C Major (K. 309) (Example 5).



Example 10

This analysis calls attention to something of some significance. As suggested earlier, a growth in size has resulted in a change in structure. Instead of two parts, processively connected through the relation of gap-to-fill, there are now three parts. Part A generates processes: in addition to the gap sequence typical of the archetype, it begins the sequence that is continued in the second part (B^1), as Example 11 shows. In the second part (B^1) these processes are developed, reaching a culminating highpoint and then falling away toward closure. The third part (B^2) creates satisfactory closure through, among other things, the realization of previously generated implicative processes (see Example 8).



Example 11

Though the sequential part (B^1) of the melody is not, properly speaking, an element in the archetypal scheme, it by no means follows that it is unimportant. It is obviously the longest and most continuous part of the melody. More significantly, it is the most intense and characteristically Romantic. Not only is the goal-directed striving of the Sisyphean pattern expressive of Romantic yearning, but many of the hallmarks of statistical apotheosis are patently present: the slowly rising sequence, the gradual crescendo and accelerando *(animez)*, the increased activity in the accompaniment (from two eighth-notes per measure to four), the sense of achieved arrival resulting from the relative stability of concordant resolution (to the E minor triad in measure 100), the placement of the highpoint about three-fourths the way through the melody, the falling-away from the highpoint through the diminuendo and the descending melodic line, and the broadening of the final phrase that results from the retention of the B (m. 100-101) and the ritard that accompanies it.[45]

The broadening of the final phrase of B^1 is significant because of its proximate effects and its remote relationships. Within B^1, the broadening at once stabilizes and emphasizes the achievement of apotheosis. The stretching of the phrase length from four to five measures also serves to maintain expressive tension even as the relaxation of the dying-away to closure is taking place.[46] The measure "added" to this phrase is, I suspect, also related to the shortened length of the second phrase of Part A *(m')*. For despite his avowed distaste for the regular and the routine, and Fetis's carping notwithstanding,[47] Berlioz evidently possessed a powerful sense of periodicity. This added measure not only contributes to the effectiveness of the last phrase of B^1, but also restores the balance disturbed by the measure removed from the end of the first period. As a result, the whole can be understood as a variation of the morphology more typical of the archetypal scheme: that is, $(8 + 8) + 24$. And the relationship, posited earlier, between y^b and y^{b-3} is made clear.

The scope and intensity of the second part are symptomatic of a significant shift in stylistic emphasis, from the syntactic to the statistical. Perhaps the nature of this shift can best be illustrated by considering the role of the upper tonic, as it has occurred in these examples. To put the matter much too briefly: in the instances from Mozart's *oeuvre*, the upper tonic, which occurs only once in each realization, serves as the root of a stable tonic triad and functions as part of the syntactic climax of the pattern. In the Beethoven (Example 7), the upper tonic occurs twice: first, as part of the syntactic climax of an antecedentlike version of the archetype and, second, as both the stable highpoint and the syntactic climax in the second part of the theme. Though features of apotheosis—the Sisyphean sequence, crescendo, and so on—are undeniably present, the fundamental processes are unequivocally syntactic.

Berlioz's melody also contains two upper tonics (Example 8). The first (m. 99) is the unstable highpoint of a cumulative, forceful statistical process. The second upper tonic (at the beginning of the final part, m. 103) represents what remains of the syntactic climax characteristic of the archetype. Not only has the preceding apotheosis overshadowed the syntactic function of the high C (m. 103), but the upward gap of a sixth (from E to C), which led to the reversal in the model and earlier instances, has here been masked by voice-leading. That is, the high C (m. 103) is perceived as following from the B over dominant harmony (m. 101) at least as much as from the E (of y^{b-3}), and the E tends to be heard as leading to the D in measure 104.

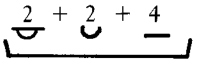
To summarize: in Beethoven's theme, syntactic climax dominates apotheosis; in Berlioz's melody, statistical apotheosis dominates syntactic climax. As noted earlier, throughout the Romantic period the importance of the secondary parameters in shaping musical process and form increases relative to that of the primary parameters. Thus, in a late Romantic piece such as the first movement of Mahler's Fifth Symphony, it is often difficult to find a single decisive syntactic climax to which lesser ones are related. Rather, there seems to be a succession of more or less equal, and local, syntactic turning points. But it is not difficult to discover the main statistical climax of the movement, for just before No. 29 in the Peters Edition, at a point of patent apotheosis, Mahler wrote "*Höhepunkt*" in the score![48]

Closure, which is the chief business of the final part, is established and enhanced in several ways:

1. The realization of implications generated by the archetypal pattern in the first part (A) fosters closure: for example, the arrival of the upper tonic (m. 103) and the subsequent filling of gaps.

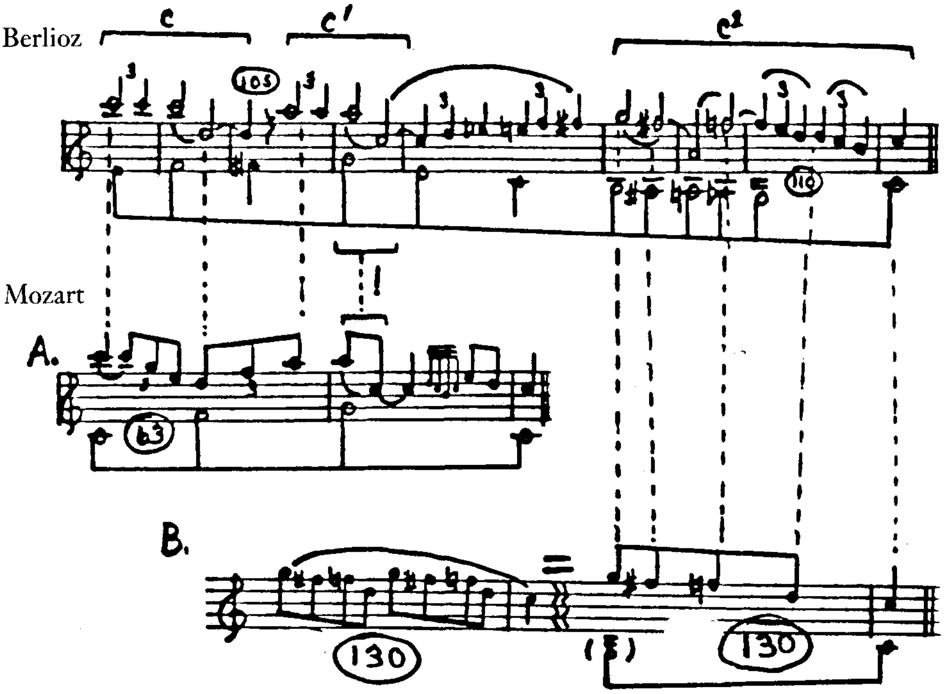
2. Although initially undermined by irregular resolution, the patent motion from subdominant to dominant harmony (mm. 105-106; 109-110) strongly implies the decisive cadence that closes the melody.

3. Harmonic closure is complemented by rhythmic closure. The largely mobile phrase rhythms of Part A (8 + 7) and Part B^1 (4 + 4) and (4 + 5) are replaced by a closed, end-accented anapest grouping:



4. But the most remarkable characteristic of this part is that, melodically, it consists of a succession of largely formulaic ending patterns. To recognize the conventionality of Berlioz's motives, it is necessary only to compare them casually with closing patterns from works by Mozart, which have, for the sake of convenience, been transposed into the key of C in Example 12. The first of the Mozart examples (A) is from the closing section of the slow movement of the String Quartet in D Major (K. 575); the second (B) is from the first movement of the Piano Sonata in C Minor (K. 457).

Given Berlioz's asserted antipathy to the formulaic and his avoidance earlier in this melody of the conventional, how is this overt use of almost stock patterning to be explained? The answer is, I think, that for Berlioz, the significant, expressive, and creative part of the *idée fixe* is over, and, for this reason, the closing period can—almost like a coda—employ conventional materials without disguise and without disdain. If this conjecture has merit, Berlioz's own compositional practice is, so to speak, behavioral evidence of his Romantic stance. For him, the heart of the melody lies not in syntactic relationships such as those of



Example 12

gap-to-fill, but in the crescendo of activity characteristic of statistical climax—that is, in the excitement of culminating apotheosis.

*   *   *

It is now time for my own coda. I have sought to show that creativity in the arts need not invòlve transcending limits. The idea that a goal of the arts and a characteristic of their history is to overturn the rules of a prevalent style and institute new ones—as in scientific revolutions—rests on a confusion. The confusion is between the histories of conceptual theories and the histories of the phenomena that the theories are devised to explain. The histories of theories have evidently tended to involve revolutions that overturned prevailing paradigms. But the histories of the phenomena that such theories are designed to explain have not, for the most part, done so. What is comparable to the history of an art such as music is not the history of conceptual theories, but the history of some phenomenon, such as the forms of life. And just as natural history has been one of combining and recombining according to fundamental principles, so the history of music has, for the most part, involved the strategic manipulation of established rules. What François Jacob has said of biological evolution holds, I think, with minor reservations, for the history of music:

> Evolution does not produce novelties from scratch. It works on what already exists, either transforming a system to give it new functions or combining several systems to produce a more elaborate one. . . . It is always a matter of using the same elements, of adjusting them, of altering here and there, of arranging various combinations to produce new objects of increasing complexity. *It is always a matter of tinkering.*[49] *(italics added)*

Though the idea of moving toward greater complexity seems suspect in the arts, regarding the history of music as having been largely a matter of "tinkering" is a salutary antidote to notions of history as dialectical necessity or as progress through revolution. And since archetypes are what composers often tinker with, understanding how they work may help us to understand and to explain the history of music.[50]

REFERENCES

[1] J. Bronowski, "The Creative Process," *Scientific American*, 199 (3) (1958): 64.

[2] In a comparable way, this model, coupled with a doubtful Hegelianism, leads Schönberg to transform Brahms into a "progressive," and encourages Webern to suggest that Bach anticipated the innovations of serialism (and was thus, despite customary belief, an innovator).

[3] This in no way denies that innovations transcending existing limits have at times changed the history of the arts.

[4] The failure to distinguish between historical importance and aesthetic significance has not only influenced our culture's view of the history of the arts, but has affected the history of the arts in our culture as well; for a considerable number of artists, as well as critics and historians, came to believe that the creative act, and, by extension, artistic originality, necessarily involved the invention and use of new syntactic means. As a result, the promulgation of new principles became a goal of art, until in an ultimate phase artists did not bother to make presentational works but simply presented the conceptual principles themselves.

[5] "Values in Language; or Where Have *Goodness*, *Truth* and *Beauty* Gone?" *Critical Inquiry*, 3 (1) (1976): 11.

[6] I have discussed elsewhere how these kinds of creativity—and their results: general propositional principles and particular presentational phenomena (works of art)—differ. "Concerning the Sciences, the Arts—AND the Humanities," *Critical Inquiry*, 1 (1) (1974): 163-216.

[7] Knowledge of prevailing constraints is indispensable, because understanding, enjoyment, and evaluation depend not simply upon perceiving what *actually* happens in a game or is presented in a work of art, but also upon the observer's ability to sense what *might have happened* or been presented. The significance of the road taken, to use Frost's metaphor, invariably includes an awareness of other possibilities that were not, but might have been, taken.

[8] In what follows it may occasionally seem that archetypes have been given a kind of Platonic reality or have been reified in some way. Thus it should be emphasized that, in my view, archetypes are cognitive constructs abstracted from particular patternings that are grouped together because of their similar syntactic shapes and/or formal plans. That is, archetypes are classlike patterns that are specially compelling because they result from the consonant conjoining of prevalent stylistic constraints with the neuro/cognitive proclivities of the human mind.

[9] As implied in this description, coherence of process can and should be distinguished from formal ordering. There are both archetypal processes (such as a circle of fifths progression in tonal harmony) and archetypal forms (such as strophic, ritornello, and binary kinds). An archetypal *pattern*, as I intend the term, combines such a process with such a form.

[10] Such archetypes are, I suspect, most unequivocally exemplified in music, because in music, syntactic process and formal structuring are explicitly presented. In this connection, see my *Music, the Arts and Ideas* (Chicago: University of Chicago Press, 1967), pp. 112-4.

[11] See my *Explaining Music: Essays and Explorations* (Berkeley: University of California Press, 1975), pp. 213-26, where I discuss the relationship of archetypes to understanding and enjoyment.

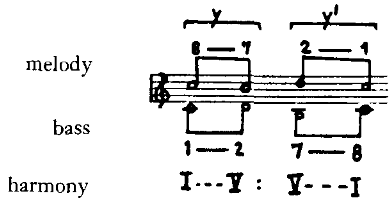
[12] In *The Selfish Gene* (New York: Oxford University Press, 1976), p. 206 ff, Dawkins suggests that "full-blown" tunes such as "Auld Lang Syne" are "memes." In my view, the archetypes of which the tune is composed are the units of cultural transmission.

[13] They are differentiated from each other by the very fact of melodic-rhythmic repetition, however varied, and by the presence of some sort of rhythmic, melodic, or harmonic articulation, however modest, separating *m* from *m'*.

[14] What is important here is emphasis, not order. Even though the third is heard first, as in Example 5, the fifth may predominate from a structural point of view.

[15] Or a substitute chord, for example, vi or $I^{7b} = V^7/IV$.

[16] This makes it evident that the archetype being discussed in this essay is a special case of a larger class—the class of changing-note melodies, whose first part is typically organized as follows:



[17] L. Meyer, *Emotion and Meaning in Music* (Chicago: University of Chicago Press, 1956), pp. 128-35; and *Explaining Music*, pp. 145-57.

[18] Usually the gap and fill parts of such a melody move in opposite directions: if the gap is created by a rising motion, the fill falls, and vice versa. But this is not invariably the case. Occasionally, as we shall see, a rising gap may be followed by a fill, at least part of which also rises. What is essential is the relation of gap to fill rather than the direction of the motion.

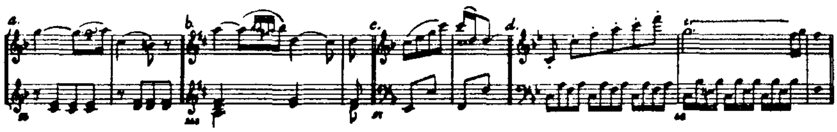
[19] The implication is specially forceful in this case, because the interval of the skip—the diminished fifth from the leading tone (7) to the fourth (4)—itself requires, and strongly implies, resolution to the third of the scale (3).

[20] The term "reversal" is, of course, borrowed from Aristotle's *Poetics* and is, I think, used in an appropriately analogous way to refer to the process in which one moves from the tension and uncertainty of relative ignorance to the stability and resolution of relative knowledge. For a discussion of this process in music, see my *Emotion and Meaning in Music*, p. 93f. and *Explaining Music*, pp. 119 ff. and passim.

[21] The only other point that needs to be mentioned has to do with analytic technique. The high C in measure 8 has been analyzed as a structural tone in the descending fill because the octave transfers D-to-D (at the beginning of the measure) and C-to-C (ending after the first beat of measure 9) are unequivocal, given the patent hemiola meter.

[22] It should perhaps be noted that the fill is quite complete—except that the second degree of the scale is only weakly present. This is compensated for at the close of the second key area of the recapitulation (mm. 146-155), where a descent from the sixth degree of the scale to the tonic, guided by fourth-species counterpoint, strongly emphasizes the second degree through deceptive cadences.

[23] For instance, the end of the opening motive of this melody (part *a.*, below) is similar in significant ways to that which first closes the Rondeau theme of Mozart's Piano Sonata in D, K. 311 (part *b.*, below); and the falling seventh at the beginning of measure 37 (part *c.*, below) occurs quite often at closes, such as that near the end of the exposition section of the first movement of Mozart's Piano Sonata in B-Flat, K. 570 (part *d.*, below).

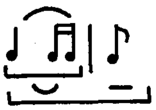


The cadential character of this realization of the archetype may be related to what appears to be a kind of formal ambiguity. When we first hear this melody, it is taken to be the main tune of the second key area of the movement. But when it returns in elaborated form after the main theme has been presented in the tonic (F major), it is not in the tonic, as it would be were this the second key area of a sonata without development; it is in the dominant, as when first presented. In other words, the theme really functions as a dominant prolongation. And it is perhaps to compensate for this disparity between form and function that the melody consists of a succession of cadential formulae.

[24] To facilitate comparison, the graphs given in the original examples have at times been slightly modified: the lowest level of structural tones has been omitted, and registers have been made more or less uniform.

[25] The overall structure of the theme, then, is P^1-P^1: P^2-P^2. Since the differences between the versions of P^1 and of P^2 are irrelevant for present purposes, only one version of each is given in the example: for P^1, measures 1-8; for P^2, measures 25-32.

[26] What is mostly responsible for the special savor of the theme is the unusual rhythmic patterning and the instrumental hocket that supports it. As line *d* of the example shows, the rhythmic group is one in which the mobile anacrusis is three times as long as the stable accent that follows it; that is,



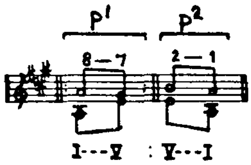
[27] Notice that hints of the archetype are present in the foreground patterning of the bass (analysis line *e*).

[28] In this case, for instance, the B to C-sharp (m. 25) implies, but does not continue directly to, D. Similarly, the linear motion B—C-sharp—D (m. 26) implies continuation to an accented E, but the melody falls back to C-sharp on the first beat of measure 27, moving to an accented E only on the first beat of measure 28. A well-known instance of the sort of Sisyphean sequence I mean to describe can be found in the melody that begins the "Liebestod" from Wagner's *Tristan.*

[29] In theory, at least, a syntactic climax can occur at a low, soft, less active part of a structure *if* that is where ongoing processes are reversed and stabilized. See, for instance, the first Prelude in Bach's *Well-Tempered Clavier,* measures 20 to 24.

[30] In this connection, see George E. Muns, "The Climax in Music," (Ph.D. dissertation, University of North Carolina at Chapel Hill, 1955). I am grateful to my former student, Dr. John Chesnut, for calling Muns's essay to my attention and, more important, for suggesting through his own work on the shape of intensity curves in music, the distinction between what I am calling statistical and syntactic climax.

[31] In my view, it is *not* surprising that Beethoven's usage is more like Mozart's than like Berlioz's—even though the last of Mozart's works considered here preceded the C-Sharp Minor Quartet by forty years, while Beethoven's precedes Berlioz's work by only four years. What most affects compositional choices is the internalization of prevalent musical constraints, and such learning almost always takes place before a composer is twenty. In this respect, Beethoven and Mozart, who were born fourteen years apart, were near contemporaries; while Beethoven and Berlioz, who were born thirty-three years apart, were not. Beethoven's ingrained classicism seems evident in the high-level organization that unites the first and second periods, for it is an archetypal changing-note pattern, similar to that which structures the bass of Part A of P^1. This pattern is:



[32] Because it is at times doubtful which of Berlioz's bass-tones should be considered structural—for instance, in measure 78, is the G or the D the main structural tone?—I have treated the first eighth-note of Berlioz's succession of pairs as being structural, except where a patently ordered pattern preempts aural attention (as in mm. 95-101).

[33] "The Permanent Revolution," *The New York Review of Books,* 26 (18) (Nov. 22, 1979): 27. Antipathy toward the conventional may also help to explain the well-known, yet curious, penchant of Romanticism for the deformed and decrepit, the diseased and even the plain ugly. The point of such unsavory, even disgusting images seems to be that their Truth is guaranteed; that is, since no one would deliberately distort or disgust, representations of the repulsive must be "honest." Artifice cannot have masked their Truth. (Or, to put the matter in terms of the Romantic belief in the virtues of the natural: what is deformed, diseased, and so on, must be natural and, therefore "good.") The next step carries us to paradox. If Truth and Beauty are one, the equation is clear: ugliness, which is

natural and guileless, guarantees Truth; Truth is Beauty; therefore Ugliness and Beauty are, if not indistinguishable, at least not opposites.

[34] This problem is, I suspect, less pressing in literature and the visual arts, because novel subject matter can divert attention away from conventions of form and process. In architecture, and to some extent in the representational arts as well, the problem was ameliorated by adopting the conventions of a more remote past or of other cultures. Evidently, conventions seemed less oppressive when thus chosen. Music, too, followed this course, escaping the compulsive constraints of the immediate past by turning to folk music.

[35] The dilemma has been solved in the twentieth century—at least for those composers who have abandoned tonality. But this has created an even more formidable problem: that of devising viable constraints to replace those of tonality; for without constraints of some sort, choice is impossible. Thus, if the history of music in the nineteenth century can be understood as a continuing effort to reconcile the claims of the ideology of Romanticism with the practical need for conventional constraints, the history of music in the twentieth century can be seen, at least in part, as a succession of attempts to devise constraints that are at once nonconventional ("natural"? "logical"?) and artistically fruitful.

[36] It is important not to make the common mistake of supposing that because something is conventional it is necessarily arbitrary. To be experientially viable the constraints of a musical style must be consonant with the broad lawlike constraints of the physical, biological, and psychological realms. *But different sets of conventional constraints may satisfy such requirements.*

[37] To take a brief but clear case: in the first Prelude of Bach's *Well-Tempered Clavier*, a descending sequential process (mm. 5-20), guided by implied fourth-species counterpoint, is broken and reversed when a skip of a fifth (C down to F) in the bass is followed by chromatic rising motion which moves to the dominant (G) in measure 24. At this point the syntactic situation is clear; but closure is delayed for eleven measures through the prolongation first of dominant and then of tonic harmony. The statistical processes generated by secondary parameters cannot, however, delay closure in this way.

[38] These are a specially clear instance of what Edward T. Cone has called "hypermeasures." See his *Musical Form and Performance* (New York: W. W. Norton, 1968), p. 79ff.

[39] D'Arcy W. Thompson, *On Growth and Form*, abr. ed. J. T. Bonner (ed.) Cambridge, England: (Cambridge University Press, 1966), ch. 2. If one of the most important constraints governing the relationship of size to structure in the natural world is gravity, perhaps the comparable constraint governing relationships in human cultures are the principles of cognition—especially, I suspect, those of human memory.

[40] Edward T. Cone's discussion of this passage is illuminating. See his edition: *Berlioz, Fantastic Symphony* (New York: W. W. Norton, 1971), pp. 254-6.

[41] The context is wrong because the V/V suggested by the melody in measure 83 should lead to a I_4^6 chord in measure 84; instead, the tonic chord is in root position. The timing is wrong because the occurrence of tonic harmony at this point seriously weakens whatever sense of authentic cadence might have been experienced at measures 85-86. In my view, Edward Cone overstates the case when he asserts that the dominant is understood in measure 85 (p. 256). If it is so, it is largely in retrospect—after the closure in measure 86.

[42] *Memoirs of Hector Berlioz*, translated and edited by David Cairns (New York: Alfred Knopf, 1969); in each case, the page reference is given in parentheses after the quotation.

[43] However, as noted earlier, the conventional character of the cadence is veiled by the tonic pedal. It should perhaps be mentioned that the stronger closure created by this proximate connection, plus the striking change of harmony in the second half of measure 94, produces a (4 + 4) pattern in measures 87 to 98.

[44] Just as this pattern gave rise to a gap-fill process in the model, archetypal *y—y'*, so it does here. And the resulting diminished fifth gaps (E—B-flat and F-sharp—C) are both followed by stepwise fills.

[45] In terms of function, Part B^1 is to the whole of Berlioz's theme as motive *ss* is to the first phrase *(m)* and motive *ss*^{1} is to the second phrase *(m')*. I am grateful to my wife, Janet M. Levy, not only for calling this relationship to my attention, but for her sympathetic, yet scrupulous, criticism of this essay.

It is amusing, and not irrelevant, to observe that if the "experiment" of Example 10 were reversed—if motives *x* and *y* were deleted and only the succession of *ss* motives were presented—one would have something approximating pure apotheosis: that is, the quintessence of Romantic melody.

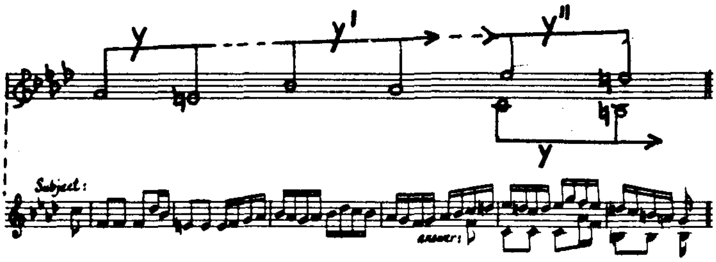
[46] As I hope to show elsewhere, "stretching" is an important expressive means in Romantic music. It can be a matter of interval as well as of duration. A very clear example occurs in "Träumerie" from Schumann's *Kinderszenen*, when what had been a perfect fourth (C to F, m. 2) in the first phrase is "stretched" to a major sixth (C to A, m. 6) in the equivalent point in the second phrase.

[47] cf. *Berlioz, Fantastic Symphony*, Cone, p. 219.

[48] Nor is Mahler the end of Romanticism: many of its characteristic traits are with us today. I do not mean merely in the music of such conservative composers as Samuel Barber, but in music that is often thought to be very "advanced." For what, after all, is the explicitly statistical music of a composer such as Xenakis (not to mention that of countless electronic composers), but Mahler without any syntax whatsoever?

[49] François Jacob, "Evolution and Tinkering," *Science*, 196 (4295) (1979): 1165.

[50] Though I had not planned to discuss another realization of the archetype, an odd coincidence leads me to do so. A few weeks before this essay was sent to *Daedalus*, my wife remarked, quite casually, that a Baroque realization of the archetype would probably be more continuous than any of the ones I had discussed in this essay. I was able to think of a Baroque instance right off because, as chance would have it, I had analyzed such an instance in *Explaining Music*—though without being aware of its archetypal patterning. The essential structure of the subject of the Fugue in F Minor from Book II of Bach's *Well-Tempered Clavier* is a slightly modified version of Part A of the archetype (*y′* descends a whole step instead of a half step), and the characteristic sequence *is* indeed continued (a possibility noted in Example 2, graph *c*) when the answer enters with the same archetypal pattern.



LEO STEINBERG

A Corner of the *Last Judgment*

"The 'subject' no longer exists in our time. When you look at the *Last Judgment* you don't really think of the 'subject,' you think of it as a painting."—Picasso[1]

THE WORK OF WHICH THE FOLLOWING ESSAY discusses the lower right corner is too demanding. It resists our grasp and confounds our notions, and it beggars the discipline whose task is to cope with it. Spread high and wide on the altar wall of the Sistine Chapel, Michelangelo's *Last Judgment* (Pl. I) has had more than four centuries of continuous exposure. But though it ranks with the world's best-known monuments, being continually reproduced and described, praised and denounced, scanned and scrutinized daily by thousands, the response of the literature remains cowed and evasive. Since the depicted profusion is indescribable, writers (not unlike the copyists who made a practice of raiding the fresco for anatomic motifs) focus piecemeal on details, or set up substitute propositions wherein the fresco in its entirety is likened to a Wheel of Fortune, a Copernican system, a gravitational field; or else abdicate before a totality needless to itemize since, like the world itself, it has everything in it—"all that the human figure is capable of in the art of painting" (Condivi) and "all the emotions that mankind can experience" (Vasari).[2]

As for the fresco's eschatological content, this is assumed to be axiomatic. We are encouraged only to remember our catechism and check off correspondences. In fact, most of the literature dissuades us from searching the content, for, as Vasari was the first to insist, Michelangelo's purpose was "*none other* [emphasis added] than to paint the most perfect and well-proportioned composition of the human body in the most varied attitudes." *Non ha voluto entrare in depingere altro che la perfetta composizione*, . . . —which leaves one unsure which is more to be wondered at: Vasari's obtuseness or the oft-repeated assurance that his text contains all we need. Yet there is never a hint in Vasari that the world's greatest artist, dedicating himself in his greatest work to what men then conceived as their greatest concern, might have produced an original interpretation of the subject in hand. Vasari's Michelangelo remains a consummate illustrator of traditional doctrine.

In 1926 Hans Tietze delivered one of the strongest statements ever made on the *Last Judgment*. He hailed the fresco as a supreme fusion of spirit and sublime form, "such as never again materialized on so large a base." More than a testimony to the religious movements of the age of the Reformation, the work is itself, he wrote, "a religious fact of the highest order, no less so than the music of

Palestrina or the Council of Trent."[3] All which I believe, yet (speaking with Hamlet) I hold it not honesty to have it thus set down; for Tietze's impressive essay neglects to ask what it is in the fresco—in its manifest substance, its compound structure and pullulation of nudes—that would lend it, that would lend any painting, the status of a portentous historic event. Tietze's declaration calls for responsive enthusiasm, like a profession made in an age of faith, not like a demonstration addressed to an age of analysis.

But the fault—if fault exists, for there is no consensus that anything is amiss—does not lie with any one writer. To see this immense fresco anew will be the work of a generation, and the present essay is no more than a bid to resume looking, and to let thinking take off from what comes in at the eye.

It is damnably difficult. As the fresco at its formal unveiling on All Souls' Day 1541 surpassed expectations and dwarfed previous triumphs of art, so it continues to win admiration as a matter of course—but it taxes one's patience. It offends by its exorbitant rhetoric, its dismissal of common decency, its indifference to the Chapel's prior systems of decoration, and its exhausting prolixity (the count of figures fluctuates between three and five hundred). Three thousand square feet of impending apocalypse; the vision *in situ* seems to assault mind and body—the mind, by flooding it in excess; the body, by obliterating that protective end wall on which we rely for our sense of physical safety when abiding indoors.

Nor has any work of art engendered such bitter contention or raised up so many protesters. While devotees of art perceived it at once as a climax of universal human achievement, the religious—those who cared about Catholic orthodoxy and the sanctity of the pope's chapel—formed an implacable opposition. They had expected what they had every right to expect: a graphic confirmation of traditional preachment. In its stead they were offered a spectacle whose moral tone seemed licentious and whose ideological drift—uncertain and fraught with personal fancies—was sufficiently deviant to be presumptuous. Even if innocent of theological error, the artist's departures from the canonic betrayed at least the psychological symptoms of heterodoxy. Why else parade Christ as a beardless pagan unknown to the faithful? Why deny wings to the angels, and to the Madonna, her intercessory role? Why make no distinction between sinners, saints, and angelic hosts? Why, following the Resurrection, was there no separation of goats from sheep? Why was the ferryman Charon, a figment of pagan myth, brought in to mock the truth of the Parousia, while St. Michael, weigher of souls, was left out? And why the preposterous postures, the shamelessness imputed to holy virgins, and everywhere the publicity of private parts? Questions which raise another: was Michelangelo—this brooding, solitary sexagenarian who had recently undergone a profound religious conversion—was he indulging in farce or, as Aretino accused him of doing, sacrificing every Christian compunction to art?

The *Last Judgment* is the only work of art to which special reference is made in the final instructions issued by the Council of Trent: it was decreed that the fresco's offending portions, the so-called nudities, be painted over; which was accordingly done—in three successive campaigns whose inroads scar the work indelibly to this day. And still the fresco barely survived repeated threats of destruction, the threats coming from those same pontiffs who bloodied the Counter-Reformation in their obsession to extirpate heresy: Gian Pietro Carafa, reigning as Paul IV (1555-1559), and Michele Ghislieri, St. Pius V (1566-1572), both former Inquisitors General. Of course I am now deliberately confounding incomparables, distinct sets of data that pertain to orthodoxy and morals respectively: papal wrath aimed, on the one hand, at holders of pestiferous doctrine and, on the other, at a painter's misjudgment. These disparata are not usually considered in concert, yet I perceive them as linked by more than the enmity they incurred. And I suspect that Michelangelo's monumental confession of faith escaped destruction only because it was painted rather than written down, its symbolic idiom no more accessible to the Holy Office than to more recent enquirers. But whoever reads the artist's poetry of the late 1530s and '40s knows this at least: that Michelangelo's thoughts on salvation were no less intense than those of other *Spirituali* who had come under the influence of Juan de Valdes. I have in mind Lady Giulia Gonzaga, for whom Valdes wrote his *Christian Alphabet*, and who spent her last thirty years in monastic seclusion; or her kinswoman Vittoria Colonna, who introduced both Cardinal Contarini and Michelangelo to the Valdesian faith. Valdes himself, living in Naples, had the good fortune to die in 1541 before the Inquisition was there established. But several of his outstanding disciples fled and apostatized (Ochino, Vermigli, Vergerio), while another, Pietro Carnesecchi, was beheaded and burned in 1567 as an unregenerate Valdesian heretic. His famous trial and execution were staged under Pius V, who would have impeached the long dead Vittoria Colonna, and who, after perusing the private papers of Giulia Gonzaga (seized posthumously by the Inquisition), declared that he would have had her burned alive had she lived. This same Pius V wished Michelangelo's fresco destroyed, even though its "nudities" had been duly veiled two years before his accession.

It is my argument that the grave unorthodoxies in the *Last Judgment* are too specific to dissipate under the head of artistic license. To cast the issue in such *l'art pour l'art* terms—whereby Michelangelo's provocations are trivialized and his opponents dismissed as Comstocks and puritans—seems historically insensitive. And no less wrongheaded is the compulsion, institutionalized since Vasari, to diagnose Michelangelo's vision of the Second Coming as an outbreak of pessimism, whether personal, Counter-Reformatory, or both. What the literature maintains is the fresco's purely vindictive, punitive character, and this allegedly as an omen of the stern spirit of the Council of Trent (1545-1563).

But the *Last Judgment* is a creation of the late 1530s. It flowered during the final phase of the abortive Catholic Reformation, when thoughtful Catholics could still speculate in comparative safety on the Last Things; when irenic Erasmianism and the Evangelical influence of Valdes were preeminent, and steadfast Papalists of crypto-Lutheran persuasion dominated the Sacred College. It was the period from 1535 to 1541, when the hopes of Cardinal Gasparo Contarini guided the Church, when believers who thought themselves stalwarts of the Roman Obedience sought to placate the transalpine Protestants by the reform of abuses and the adoption of the crucial Valdesian-Lutheran doctrine of salvation by faith. After 1541 the zealots prevailed, and we abruptly enter the age of Carafa. The next three decades are stamped by coercion and dread, by the burning of books and heretics, by the rule of the Inquisition, the Council, the Index.

Michelangelo's fresco is not of that rule. Chronologically, it precedes the quietus of Renaissance humanism in Italian religion. Only the commentaries on the fresco belong to the ensuing phase of repression; and they, read with care, betray their date. Thus Vasari, in the text he completed in 1547, discerns in the upper zone of the fresco "countless saints and other figures embracing and rejoicing at attaining eternal happiness by the grace of God as a reward for their works" *(per guidardone delle opere loro).* As a reward for their *works*? This is not visually given. We do indeed see countless saints in beatitude, but not whether they gained it by works or *ex sola fide*, by faith alone. Judged as objective description, the Vasarian reference to "works" at this point is gratuitous. But not so when we recall that the doctrine of justification, whether by works or by faith, had been the central issue at the Council's first sessions; that the prelates espousing the *sola fides* position were irretrievably routed; and that the first Tridentine decree, which promulgated the Catholic dogma on justification (that man's free will cooperates with divine grace in attaining salvation), was passed in January 1547. Thereafter, overnight, tolerance ceased. No former follower of Valdes was thenceforward secure in his life, no friend of the *Spirituali* could ever again shake off the suspicion of heresy. And within the year, Vasari tries to exonerate Michelangelo's berated fresco by describing its choirs of saints as rewarded for works, that is to say, as received in a Roman Catholic heaven.

Vasari's merit, then, resides less in veracity than in his loyalty and timely defense of the master. That this earns him a place in heaven I do believe, but not necessarily what he says. And the question before us is whether we are to confine Michelangelo's vision forevermore to the terms Vasari laid down for the 1550s and '60s, terms perpetually rehearsed by his modern readers and insisted on in the name of historical method, as though Vasari's apologetics rather than Michelangelo's fresco were the "primary source."

So formulated, the problem is hardly yet one of history or theology—these come later. The primary problem is simply our educated reluctance to take seeing seriously; for it is easier to read and rely on one's reading than to keep vision alerted and trust appearances. Reading discursive prose we feel confident that the vehicles of signification are guaranteed, that meaning is promoted (more or less) by dint of words. But in confronting such imagery as Michelangelo's, we are unsure of locating the agents of meaning; whether, for instance, gaps and interstices between narrative elements in the fresco should be regarded, like musical intervals, as integral to the significant structure, or be disregarded, like interlinear spaces in print; whether the aligning of certain features on a diagonal forms part of the code; whether the incidence of the Madonna's bare foot constitutes a semantic value (as I think it does). The modalities of significance in a painting are unforeseeable; they may have arisen *ad hoc*, may never recur, and, of course, may be skeptically discredited. In parsing a painting one stoops to inferior orders of certainty, and it is understandable that folks who seek surety while looking at art reach for collateral reading. They are following a millennial tradition exemplified with marvelous candor in that classic of literary description, the *Imagines* of Philostratus. Here, in his first *ekphrasis*, the preceptor teaches his pupil that the way to master pictorial meaning is to keep eyes averted and fixed on a text:

> Have you noticed, my boy, that the painting here is based on Homer, or have you failed to do so because you are lost in wonder . . .? Well then, let us try to get at the meaning of it. Turn your eyes away from the painting itself so as to look only

at the events on which it is based. Surely you are familiar with the passage in the Iliad where . . .[4]

This Philostratian anxiety to adduce a text that will help one steer safely past a difficult painting, lest he get lost in wonder, besets all the literature on the *Last Judgment*. Hence the constant appeal to Vasari or Dante's *Inferno*, the *Dies irae* or Revelations. What has yet to be documented is the inhibitory effect of such invocations on optical capabilities.

A striking instance of vision thwarted by a scriptural association is the routine miscount of the trumpeting angels at the nombril point of the fresco (Figs. 20, 21)—at sight of whom both Vasari and Condivi bethink themselves of the Seven Angels of the Apocalypse; and so to this day have they been dubbed and numbered. Now, it is hardly likely that our authors were unable to count up to eight, and yet eight is the complement of Michelangelo's buglers. Did the painter lose count, or had he—as will be shortly proposed—some task in store for these angels that was incompatible with the Johannine band of seven? Whatever their office, however startling their role in the fresco's redemptive scheme, the matter has perforce gone unobserved, owing to the initial assumption that their identity, and hence their function, were textually preestablished. The Michelangelo literature perpetuates Vasari's miscount, content in the faith that no one supernumerary, no painted extra, could withstand the authority of St. John.[5]

Effective as Holy Writ is, anecdotes impinging on works of art are even more blinding. Indeed, the feat of rendering a conspicuous visual datum invisible is best accomplished by spreading a story about it. Thereafter, for most people, the thing itself becomes a superfluous illustration or, to the extent that it fails to square with the story, an inaccuracy.

First, then, I will have to deal with the tyranny of the written word. In the instance of the particular corner I propose to discuss, one of Vasari's anecdotes has served for over four centuries to obscure what Michelangelo painted. It so happens that the following essay, by producing a hitherto unpublished text, discredits that anecdote once and for all. But my satisfaction in the result is mixed with regret, for I know that the new situation will be accepted only because one piece of writing has ousted another—a long-supposed "primary source" has been overruled by an earlier scribble. Whereas the lesson for me lies elsewhere. It lies in the eloquence of Michelangelo's image, which, being freshly observed, furnished the impetus to locate such a document as would effectively falsify a distorting literary irrelevance. I proceed, as step one, to the removal of the anecdotal obstruction.

ONE HOPES TO BE TELLING THIS TIRED TALE for the last time: how the Vatican's Master of Ceremonies complained of the nudities in the Sistine *Last Judgment* even before the fresco was finished; how the painter retaliated by depicting his critic in the loathsome figure of Minos—way down in the lower right corner (Pl. II, Figs. 3, 4); how the poor monsignore, mortified and abashed to see himself hell-bound in effigy, was there confirmed by a fun-loving pope, who silenced his protest by pointing out that papal influence, unfortunately, did not extend to Hell; and, finally, how the historicity of the affair is attested by more than one independent contemporary, including Vasari. All this everyone knows—"or has some reason to know by this time, the matter having been rather frequently mentioned."[6]

Frequently and with relish: the list of prestigious scholars and authors who delighted in recounting the incident runs to four-and-a-half pages in Paola Barocchi's commentary on Vasari's Michelangelo *Vita.*[7] From the mid-sixteenth century to the present, few writers on the subject of Michelangelo's fresco were dull enough to forgo a story so irresistible in appeal, so congenial in its denouement, and so well authenticated. A meddling prude meets his reward. Hearing this welcome gospel, we post ourselves instantly on the right side of things—that is to say, on this side of philistinism, this side of damnation.

To pick such a story apart on grounds of implausibility must seem insufferably pedantic. Michelangelo, God knows, gives us little enough to chuckle over and, in the *Last Judgment*, no other light entertainment—so why not leave the Master of Ceremonies to roast? Because there's some nastiness here, as we shall see. But for the moment let this suffice: the story is historically improbable, chronologically inconsistent, psychologically obtuse, theologically unsound; and what is worse, it dims the reality of the painting. For the shock of that fearful corner it substitutes a commonplace about artistic freedom from interference, so that instead of sharing Michelangelo's shudder, we relax with Vasari in a commendable attitude, simply applauding the artist for giving old sobersides what he deserves.

But let us allow the Master of Ceremonies a few words of extenuation. We have little cause to condemn him, since the offending features in the *Last Judgment* challenged perfectly ordinary sensibilities; thus no particular squeamishness need be laid to his charge. His whole misfortune consists in his having been the first in the field, the first of thousands who were to cry shame louder than he. And yet, by the conventions of our discipline, whereby one who discerns something of note in advance of his fellows earns credit for it ever after, ought we not rather to honor the monsignore for pioneering the observation that Michelangelo's fresco contained improprieties?

Consider the figure of St. Catherine (near the right cornice, inward from St. Sebastian). In her present overpainted condition she wears a scintillant yellow-green shift that leaves only her brawny arms showing (Fig. 1). But early copies reveal her original state and recall the scandal it raised (Fig. 2).[8] In the words of one modern writer: "St. Catherine of Alexandria, the chaste virgin whom no artist, not even in the scene of her martyrdom, had ever shown nude, was depicted by Michelangelo frontally and without any veil."[9] But the writer is not telling all. Michelangelo's St. Catherine, the most eligible among holy virgins for mystic marriage, was represented not only as a stranger to shame, but as fat; and this at a time when images of obesity were associated either with comic exaggeration or with moralizing, as in allegories of Sloth.[10] To men of the early sixteenth century, a nude female saint complacently overweight must have seemed an imposture, a mockery.[11] And the artist's irreverence, his sheer flippancy, seemed confirmed by St. Catherine's uninhibited posture toward St.

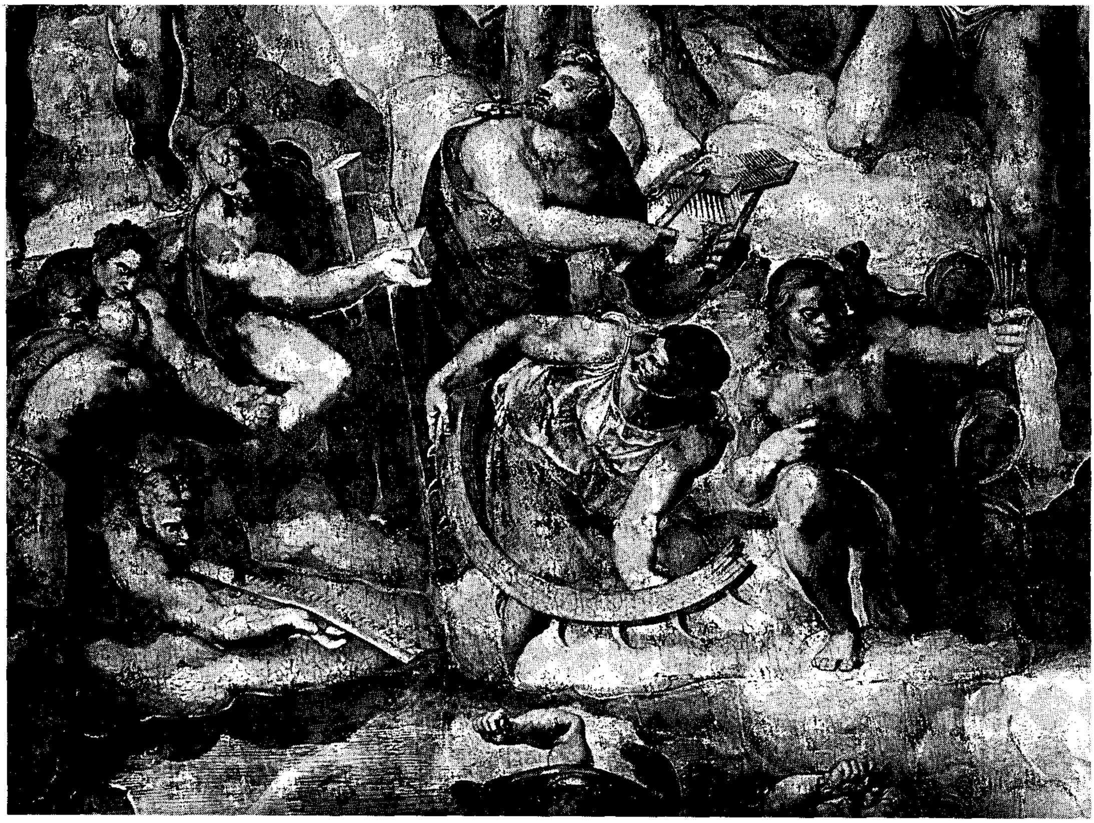


Figure 1. Michelangelo. *Last Judgment*. Detail of martyrs' group.

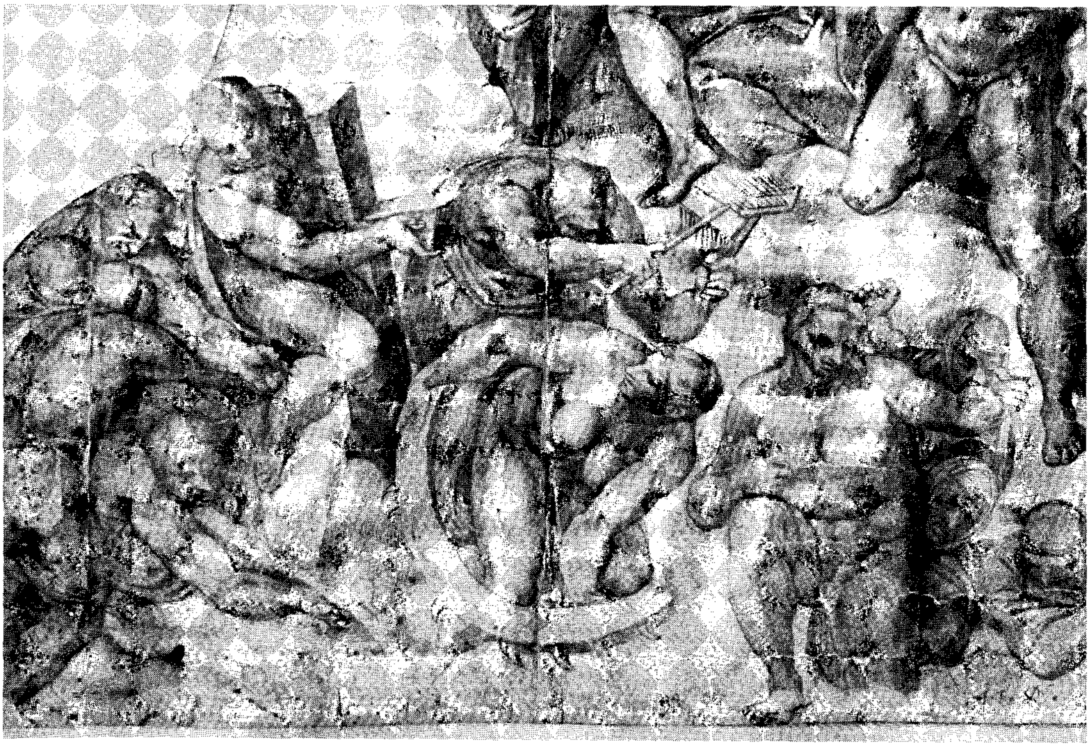


Figure 2. Gaspar Becerra after Michelangelo. *Last Judgment*, drawing. Detail of martyrs' group. Madrid, Museo del Prado.

Blaise, her tandem saint, whose upper body had to be painted anew and reoriented in the direction of Christ, because his supposed eagerness for the plump wench in his path had set every vulgar tongue in Rome wagging. As one sixteenth century faultfinder put it: "To make it funnier, he [Michelangelo] made her bend down in a not very decent pose in front of St. Blaise, who, standing over her with the hackles, seems to admonish her to keep still, while she turns around at him as if to say, 'What are you doing?' "[12] All of which is, of course, arrant nonsense, compounded of prurience and a misunderstanding of spatial relations. Michelangelo did not—as Stendhal later fantasized—impute sodomy to St. Blaise. Yet something there was in the fresco, in the physicality of its enskied heavyweights and the teeming of naked friends, that invited slander and made it stick.

Michelangelo had been overzealous in affirming the carnality of the afterlife. What Christian since Paul had taken bodily resurrection so literally? The artist's contemporaries entertained more ethereal notions of immortality, conceiving the state of the blessed as less grossly encumbered. No matter what the Creed said, they would veil the saints' risen bodies in subtlety. Hence the affront administered by Michelangelo's vision. It was one thing to celebrate the human form for its comeliness, for the divinity reflected in its proportions, or as a vessel of continence. But flesh flourishing and abounding offended the ethos of a religion whose ingrained asceticism hardly made flesh seem worth resurrecting, at least not in such plenitude. No wonder that Michelangelo's Baroque premonition was denounced in almost every sixteenth century blast at the fresco.[13]

And there was matter here even harder to stomach—provocation so blatant that the harshest critics shrank even from naming it. Such (before overpainting) was the personification of Lust further down along the right margin:[14] an obscene lecher haled down by his scrotum (Pl. III). Even today, motifs of this sort would probably be unacceptable in a public building, sacred or secular. If they seemed unacceptable in 1540, we do better to think, not that the Master of Ceremonies was being difficult, but that Michelangelo was.

The story comes down to us in three variants. In the first edition of Vasari's *Lives*, completed six years after the fresco was finished (i.e., in 1547, though not published until 1550), we read that Pope Paul III came to inspect Michelangelo's work while in progress, and that the *maestro dell'ceremonie*, "exercising presumption" by entering along with His Holiness, censured the profusion of nudes in the fresco; an insult which Michelangelo repaid by portraying the as yet unnamed official in the figure of Minos, "*nel'Inferno*" amidst troops of devils.[15]

In 1562—twenty-one years after the fresco's unveiling—the story turns up in Lodovico Domenichi's collection of anecdotes, known for short as the *Facezie*.[16] Here the Master of Ceremonies is given his name and becomes a historical personage about whom we know a good deal—regrettably so, from the viewpoint of narrative, for the veridical matter substantiates the antagonist as a person, where the anecdote calls for a type. But here he is, nonetheless, on the same footing with painter and pope. Biagio Martinelli da Cesena (familiarly, Biagio or Cesena) was an elderly monsignore whom Leo X had appointed in 1518 to serve alongside the better known Paris de Grassis. After the latter's retirement to become Bishop of Pesaro, Biagio assumed full responsibility for the post which he maintained honorably through four papacies. Invaluable to historians are his meticulous diaries, especially those from the troubled reign of Clement VII.[17] In 1540, the year he retired, Biagio was seventy-seven years old and ailing; and declined the offer of a bishopric from Paul III for reasons of poverty and old age. He died four years later in Rome, far from his native Romagna, and had been dead eighteen years when the *Facezie* appeared.[18]

In Domenichi's account of the event, Biagio protests to the pope that Michelangelo had depicted him "*tormentato da diavoli in inferno*," Michelangelo having taken it ill that the monsignore had "presumptuously" peeked at the fresco before the artist was ready. No mention here that Biagio found fault with the work, nor that he was represented in the figure of Minos—which, indeed, would be silly, since a Prince of Hell is not himself "tormented by devils." But in Domenichi's version (disregarding a certain confusion between Inferno and Purgatory rectified by subsequent authors[19]), the pope's witty rejoinder is at least plausible: his confessed powerlessness to intercede for the Master of Ceremonies makes sense if Biagio suffers Hell's torments as a damned soul; it would make no sense whatever if he inhabited Hell as a demon.

Six years after the *Facezie*, in Vasari's second edition of 1568, the story returns in what we may call its canonic form—enriched by factual *precisioni*—and "entirely overhauled" (Barocchi). We learn that the incident occurred when the fresco was more than three quarters finished, that is to say, when only the lowermost zone remained to be painted.[20] No longer is Biagio's forwardness made the cause of the artist's vexation. We now hear that the visiting pope, accompanied by his *ceremoniere*, asked the latter's opinion and received answer that such unseemly nudities were better housed in a bagnio than in the pope's chapel; a formulation which, as Barocchi rightly observes, Vasari adopted from Aretino.[21] At this, Vasari continues, the artist avenged himself at once, "*subito*," by portraying his critic from memory, naked *(di naturale)*, "*nello inferno nella figura di Minos*," with a great serpent about his legs [*sic*];[22] and, finally (following Domenichi's version, but without mentioning the pope's pleasantry), that Biagio's remonstrance, addressed to His Holiness *and* to the artist, brought no redress.

It may be coincidental, but Vasari had already recounted a similar tale about Leonardo da Vinci who, he tells us, portrayed the carping prior of S. Maria delle Grazie in the figure of Judas in the *Last Supper*. In both instances—*Last Supper*, *Last Judgment*—the artist settles accounts with a pestilent nag by equating him with the most malignant party on hand. Was it this literary association that led Vasari to graft the presumed Biagio portrait upon the diabolical figure of Minos? For Vasari's account is not only rigged with borrowings from Domenichi and Aretino; it is self-contradictory. If he had information that Michelangelo painted Biagio's likeness *subito*, following an incident that occurred when the first three quarters of the fresco had just been completed, then how could that portrait have settled on Minos, situate three *giornate* below, for whose figure the plaster had not yet been laid?[23] Two of Vasari's purported facts cancel each other out, with significant consequences for the emotions engaged: either Michelangelo painted Biagio's portrait "at once," that is to say, as an impulsive riposte—but then it could not have landed on the shoulders of Minos; or he portrayed him in the figure of Minos—but then must have done so from long-festering spite, and not *subito*.

There is dross enough in the story to make it suspect. Several scholars long ago disbelieved it entirely.[24] But their qualms, lacking substantiation, could not avail against the consensus that this was too good a tale to let go; and that a report reaching us from more than one source independently satisfies every known criterion of truth.[25] As a result, the historical Biagio da Cesena leads a double life in professional literature: underground in bibliographical footnotes as indispensable diarist and primary source; and up in the text as a villain of fable. Occasionally, writers try to blend his two natures—invariably to the detriment of his humanity. Thus Carlo Grigioni decides that Michelangelo must have considered Biagio a hypocrite, fully deserving of the punishment he incurs in the fresco, since it was common gossip that this "odious moralist" had an illegitimate daughter. Elsewhere Biagio is naively nominated the most dangerous of Michelangelo's foes, "murmuring continuously" against the offensiveness of the fresco; which Biagio may well have done, but how would one who is not a novelist know?[26]

The unkindest of glancing blows at Biagio comes from Gaetano Moroni in the ninety-seventh volume of his stupendous *Dizionario di Erudizione ecclesiastica.* Recounting Clement VII's journey to meet Charles V in Marseilles, Moroni relies on Biagio's *De Itinere Clementis VII usque Massiliam.* We learn that the pope reached Pisa on September 24, 1533, and on the feast of Cosmas and Damian, accompanied by ten cardinals who later joined him for dinner, heard Mass at S. Matteo delle Benedettine, granting plenary indulgences to those present. Thereafter, His Holiness allowed his foot to be kissed by the abbess and monks, and—but here follows a breach of protocol and an instance of Biagio's conscientious attention to duty. Up to this point Moroni's narration has been an Italian paraphrase of Biagio's Latin. Now, suddenly, Moroni imports the original text, but only to break into it with a vernacular interruption. In rough English (abbess and monks having kissed the pope's foot): "following these, lay women likewise bestowed the kiss against my will (exclaims the zealous Martinelli! He it is who was punished by Michelangelo . . .), myself protesting, albeit inaudibly, this being contrary to use and propriety."[27] Moroni's parenthesis, wherein Biagio's "inaudible" protest swells to an "exclamation," is of course meant to make Biagio run true to type as a prude, and this seems a little unfair. If papal protocol barred secular women from kissing the pontiff's toe, Biagio, observing the violation, was doing his job and doing it with admirable discretion, registering his disapproval *sotto voce,* without disrupting the ceremony or embarrassing the participants. Yet his professional vigilance is interpreted, by a methodical ecclesiastical encyclopedist (who delivers his own interruption with exclamation mark!), in the light of the Vasarian anecdote. Honest Biagio has had a bad press.[28]

But it is not Biagio's good name that concerns us so much as the effect of Vasari's anecdote on our perception of Michelangelo's creative process. To what extent was the cast of his characters determined by felt necessity; to what extent changeable, and under what sort of stimulus? Did the artist conceive face and body together in one integrated persona or design in the mode of late Roman Emperor statues, mortised for replaceable heads? Michelangelo despised portraiture: were his dramatis personae so loosely determined that a moment's pique could lead him to particularize a physiognomy, disregarding the trunk?

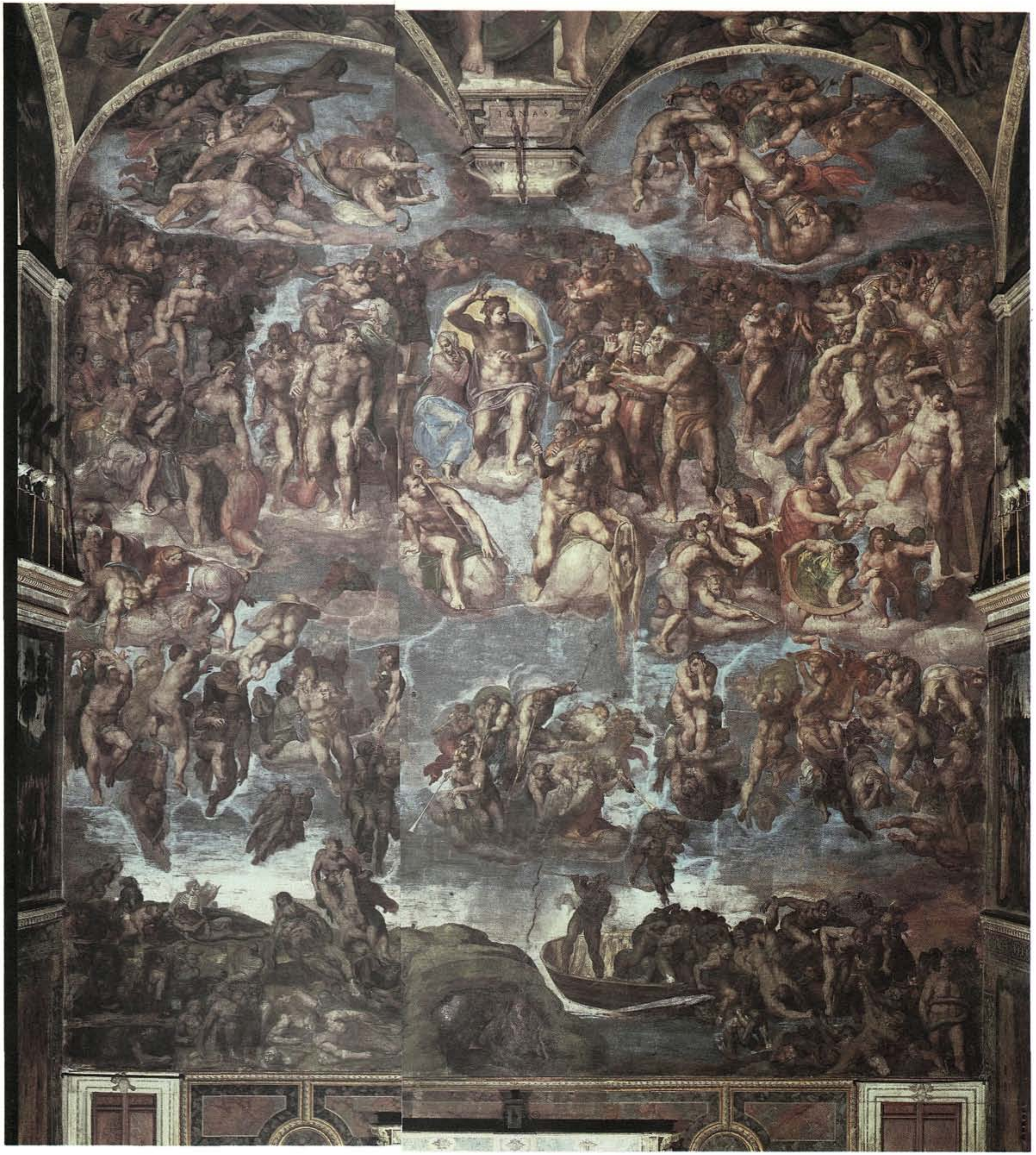


Plate I. Michelangelo. *Last Judgment*, fresco. Sistine Chapel, Vatican.

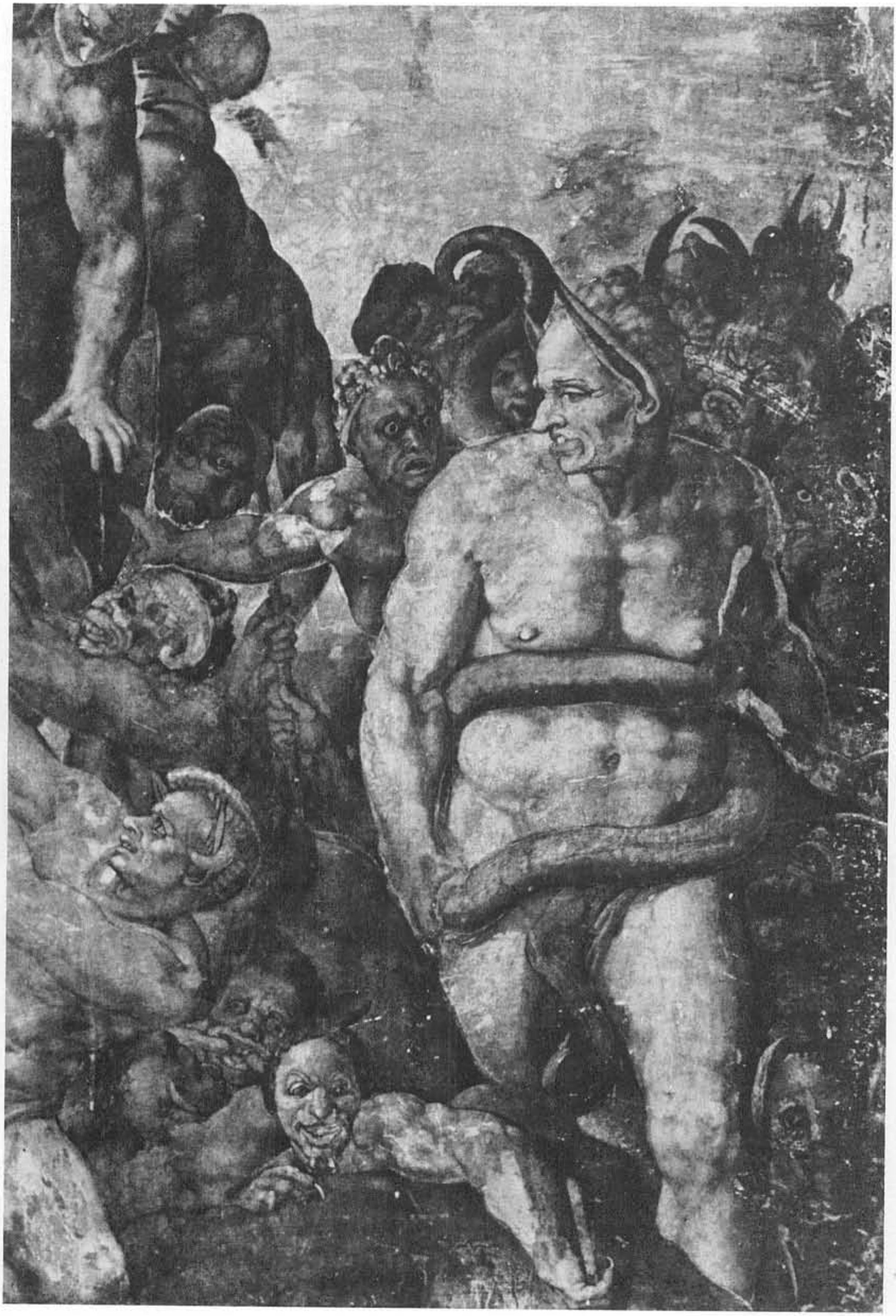
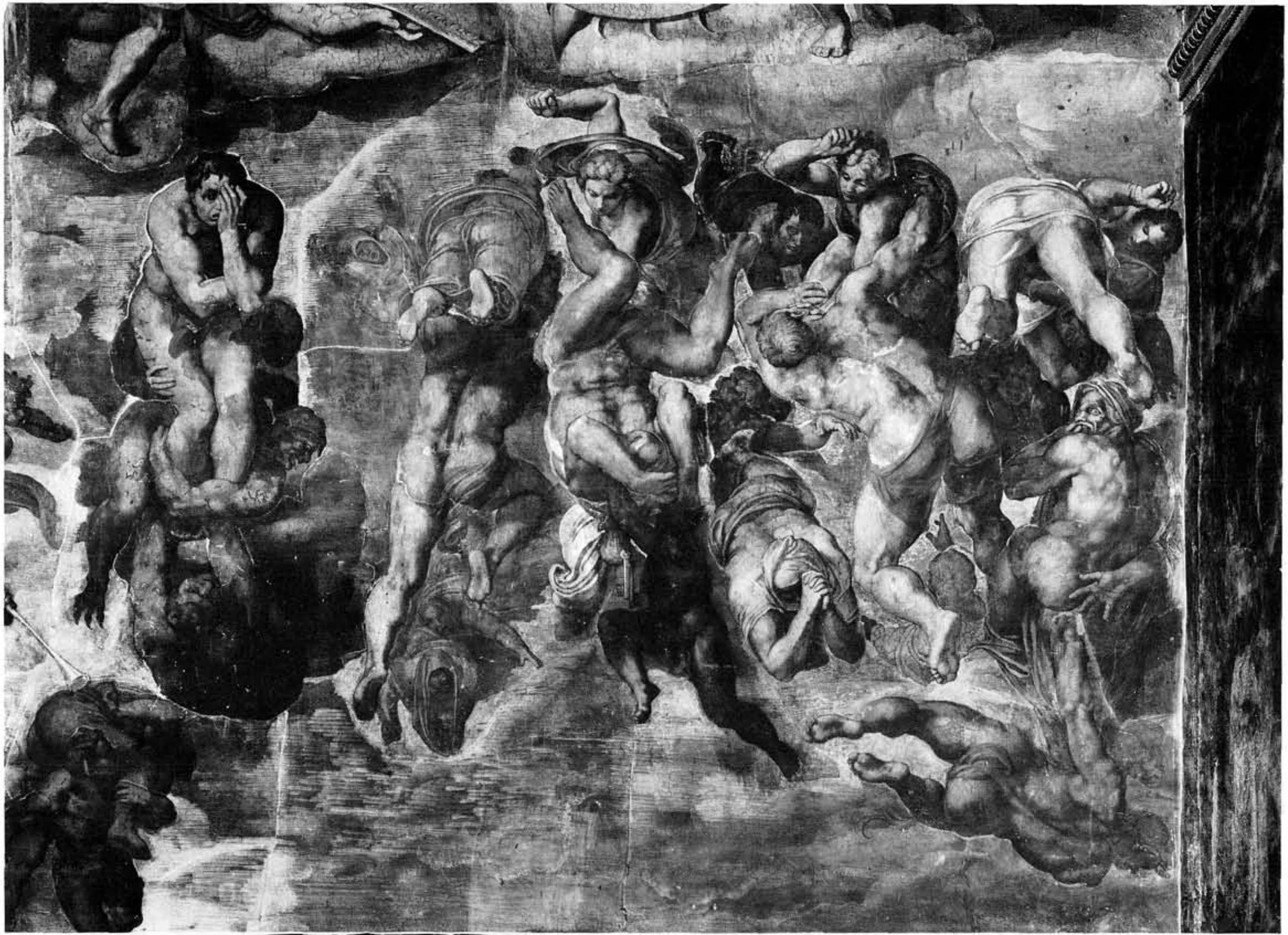


Plate II. Michelangelo. *Last Judgment*. Detail of lower right corner.

Plate III. Michelangelo. *Last Judgment*. Detail of Deadly Sins.



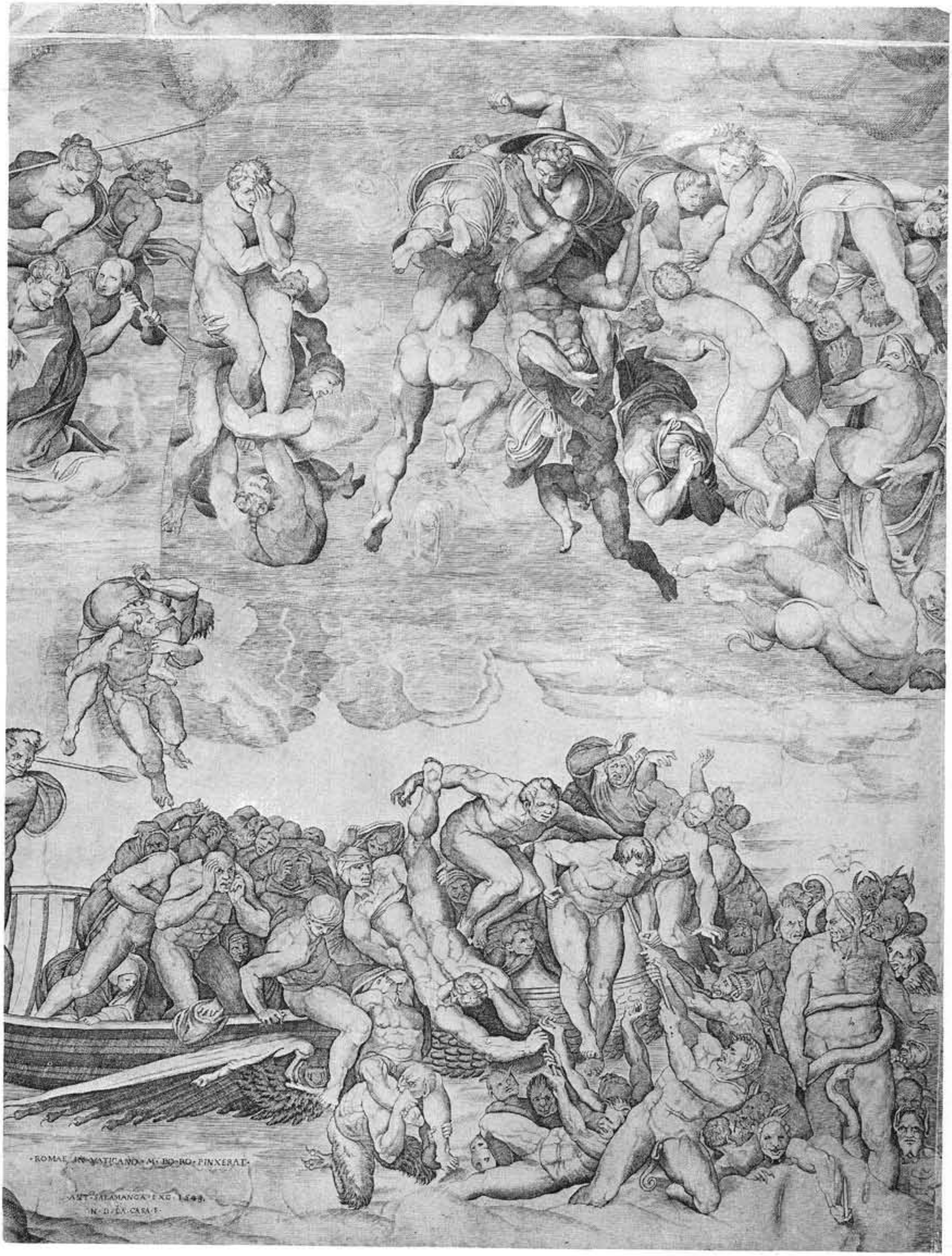

·ROMAE IN VATICANO·M·BO·RO·PINXERAT·
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Plate IV. Niccolò Della Casa after Michelangelo. *Last Judgment*, engraving, 1543. Detail of lower right corner.

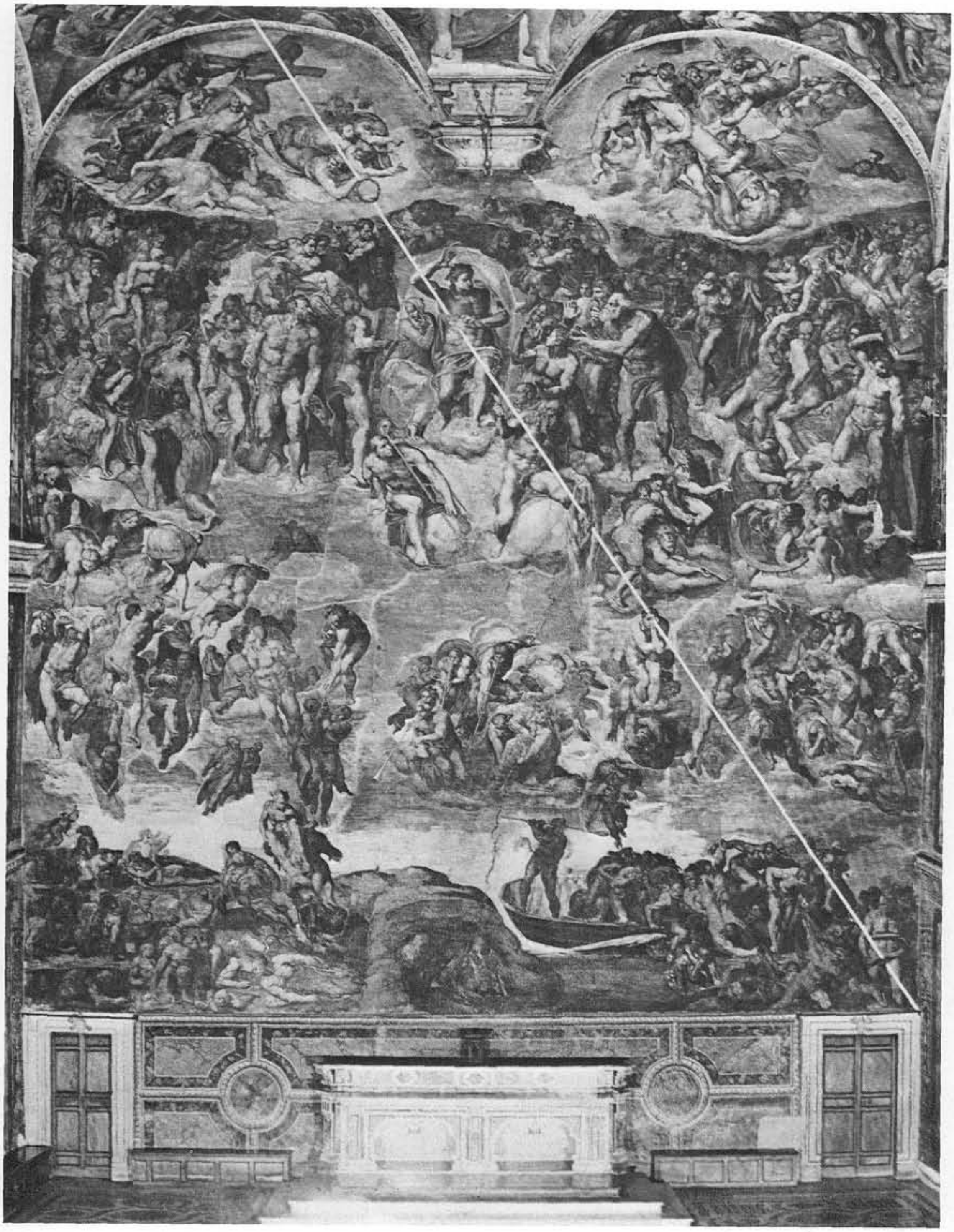


Plate V. *Last Judgment* with diagonal overlay.

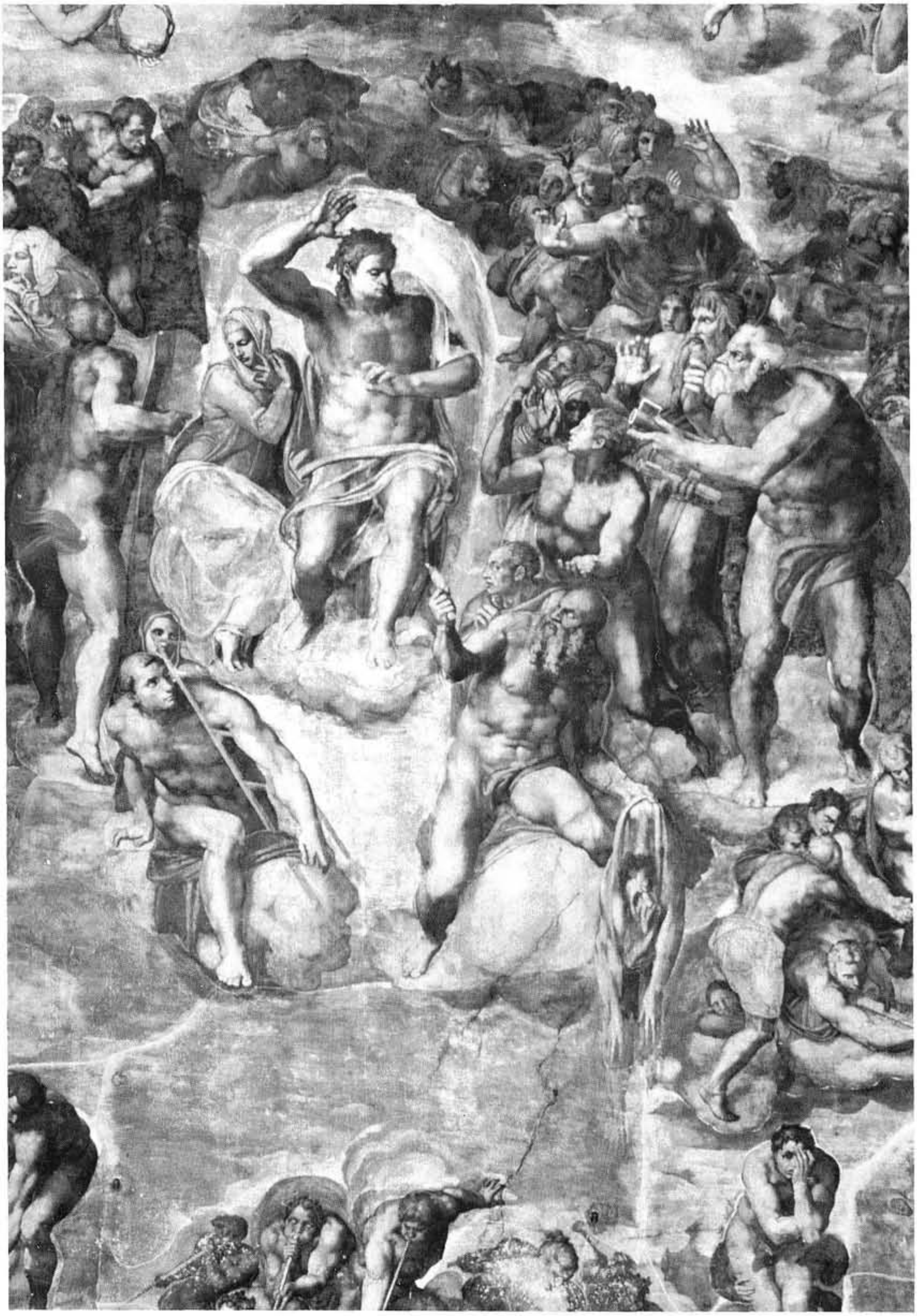


Plate VI. Michelangelo. *Last Judgment*. Detail of center.

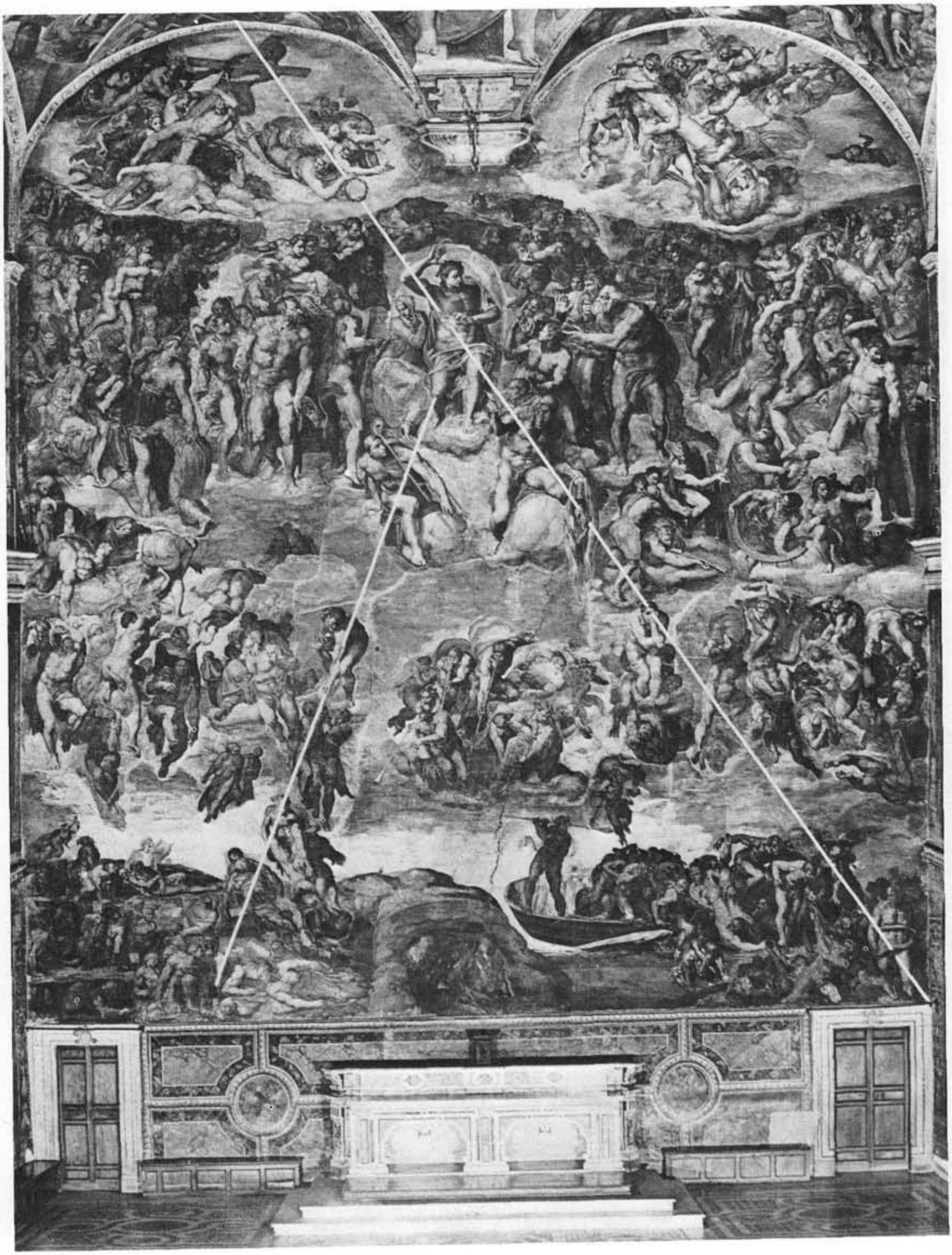


Plate VII. *Last Judgment* with diagonal overlays.

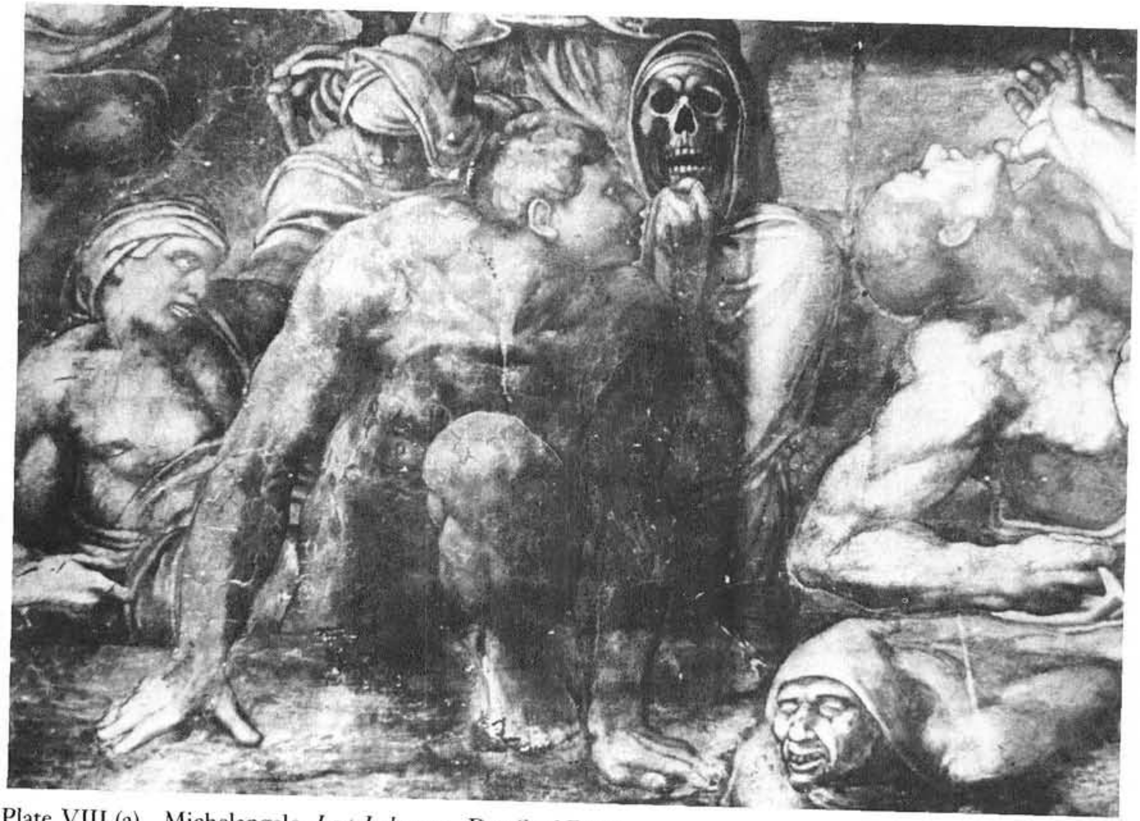


Plate VIII (a) Michelangelo. *Last Judgment*. Detail of Death.

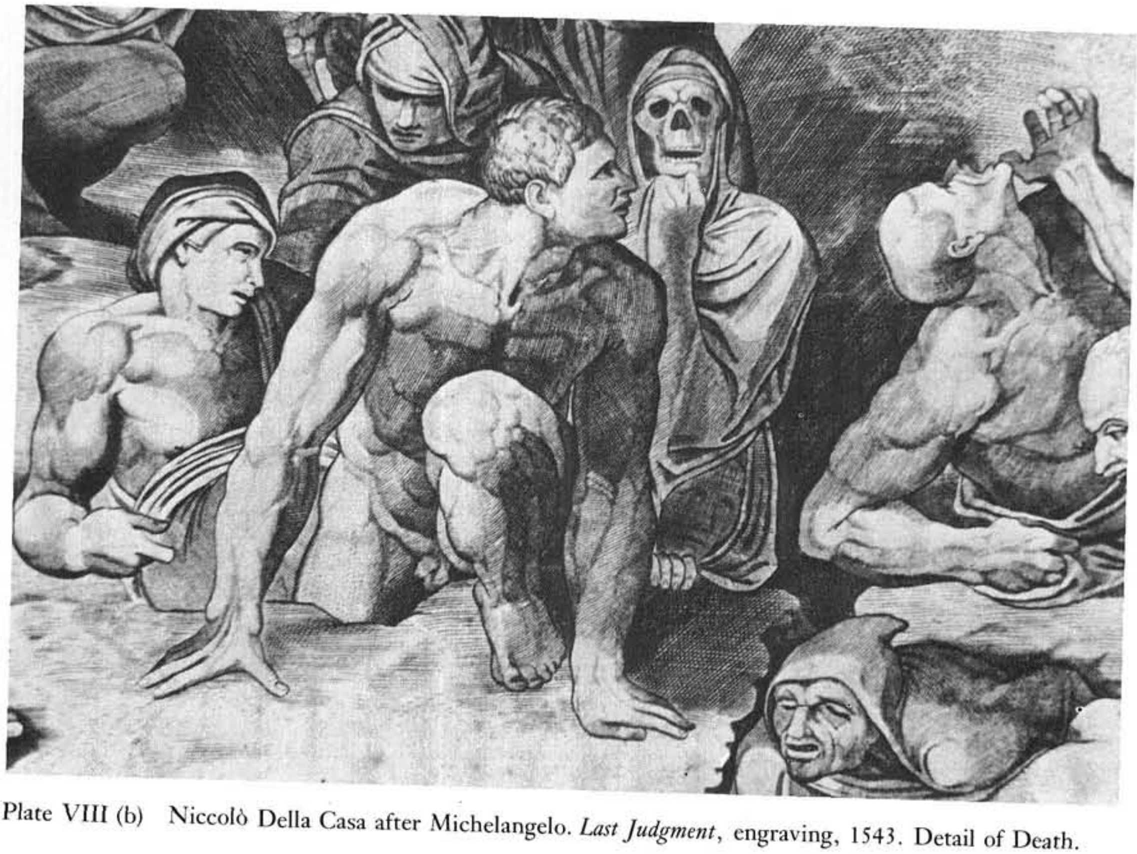


Plate VIII (b) Niccolò Della Casa after Michelangelo. *Last Judgment*, engraving, 1543. Detail of Death.

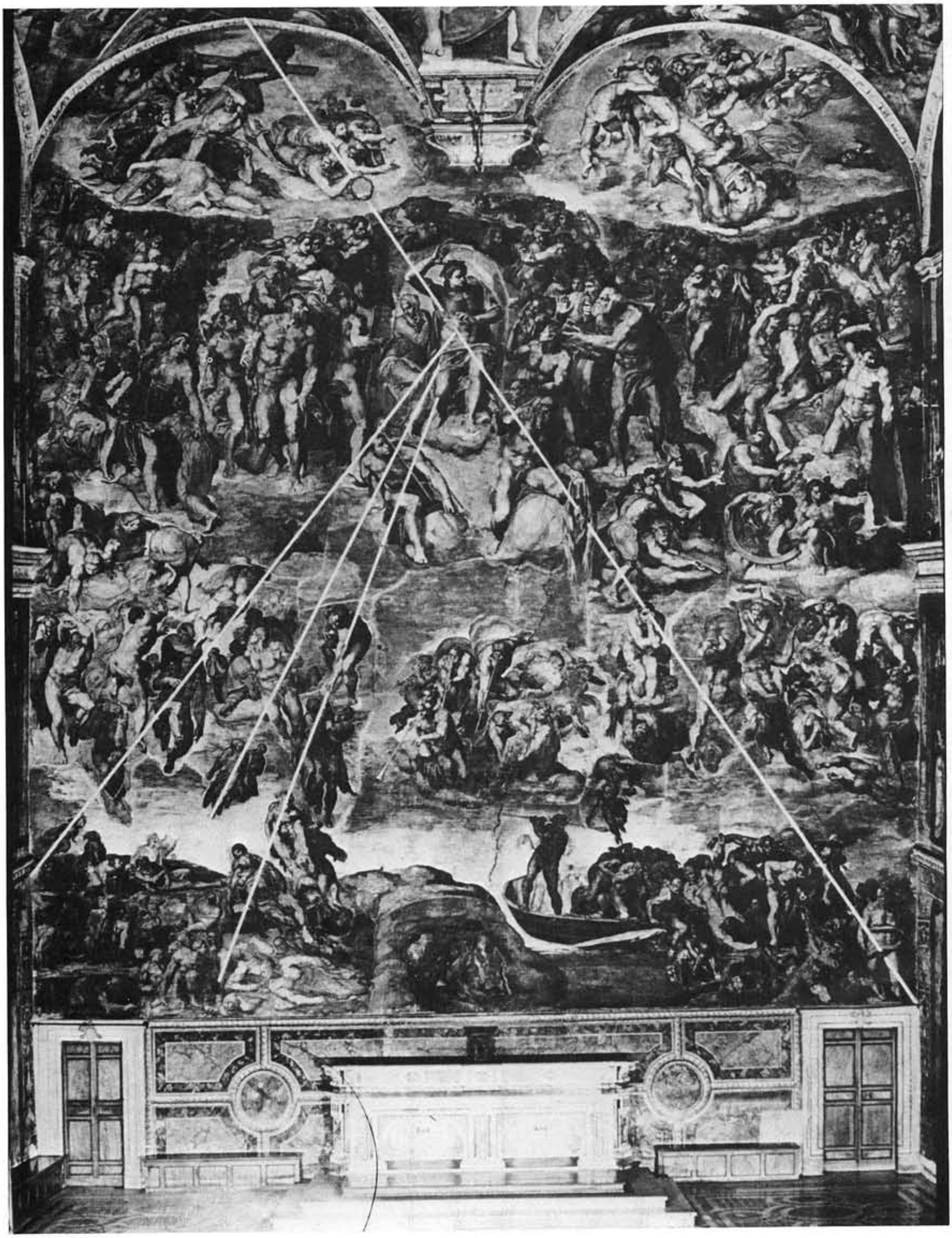
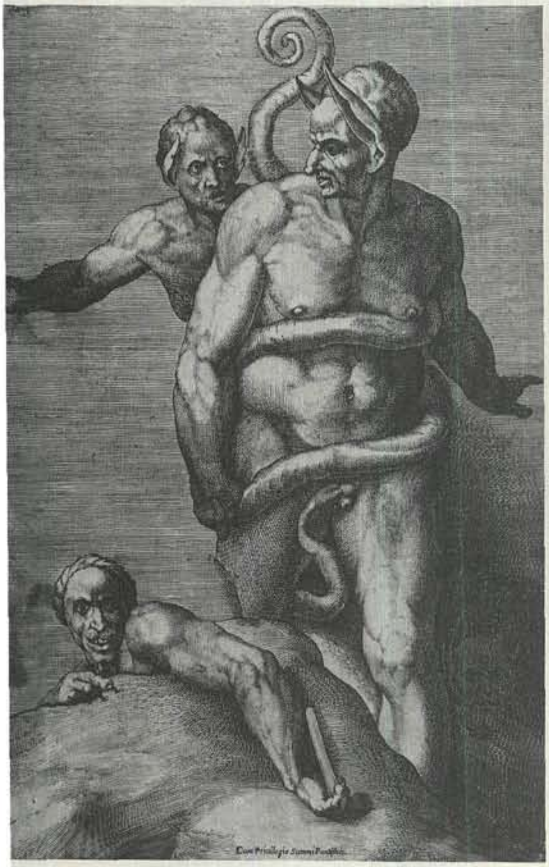


Plate IX. *Last Judgment* with diagonal overlays.

Such disregard of a body's integrity is more likely to be a projection of ours and, indeed, during the past hundred years of Michelangelo scholarship the diabolical figure of Minos, which supposedly bears Biagio's aspect, has not been seen whole (Pl. II). Because a legend, a literary association, invests the face, it is the face alone that gets the attention. The usual citation of its alleged likeness is sometimes enriched with a note on its canine snarl, said to be redolent of the malicious grin Minos wears in Dante's *Inferno*—which would confirm Michelangelo's figure in the character of the infernal judge; and one stumbles on references to his asses' ears, supposed to allude to Biagio's bad judgment—though this would undo the character of Minos, whose judiciousness even Christ does not question.[29] And throughout these lame hermeneutics, wherein Michelangelo emerges as the most lackadaisical of iconographers, only the head calls for comment, the remainder for silence. But does not the credibility of Vasari's anecdote depend on the fullness of the apparition, on the fact that this stunted colossus, this giant dwarf, ogre and gnome, sports a head abased like a hunchback's, a thick rigid trunk twined with a serpent, and a penis vised in the serpent's mouth?



gure 3. Cherubino Alberti after Michelangelo. *inos*," engraving.

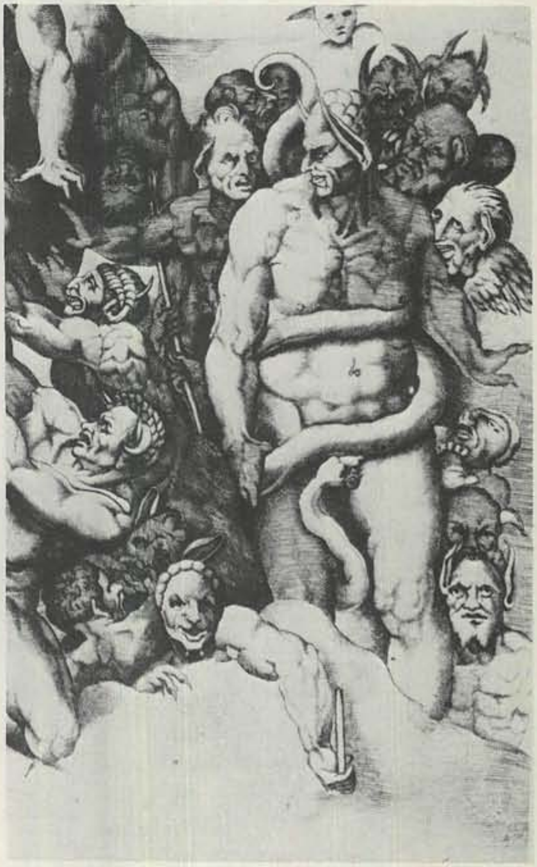


Figure 4. Niccolò Della Casa after Michelangelo. *Last Judgment*, engraving, 1543. Detail of lower right corner.

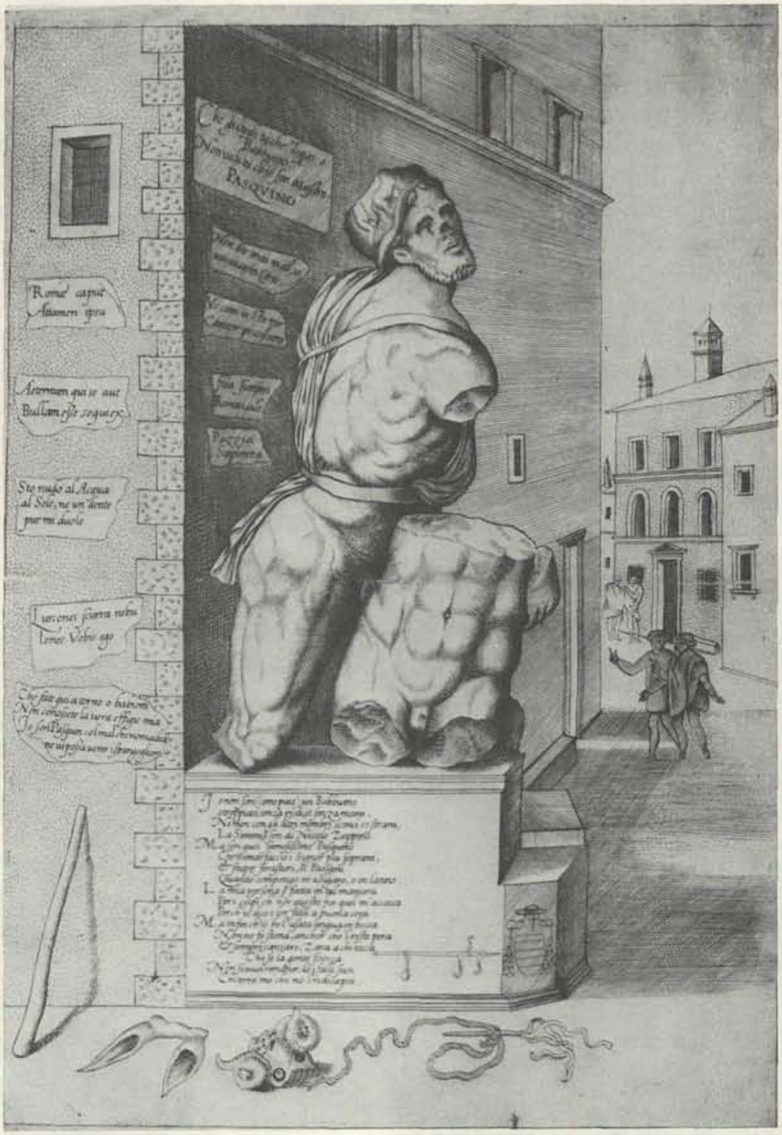
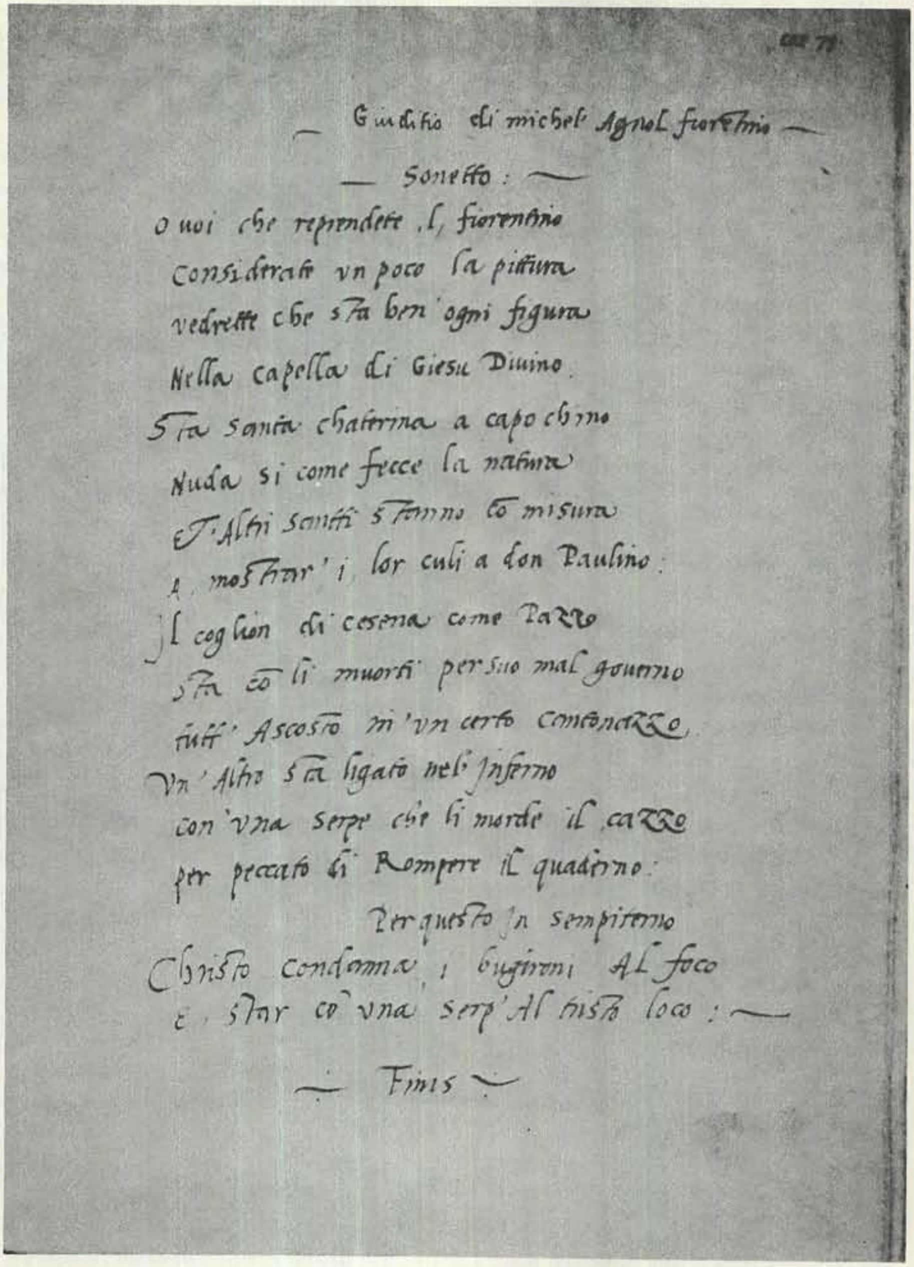


Figure 5. Anonymous mid-sixteenth century engraving of antique group nicknamed *Pasquino*.

This last item no longer shows in the fresco, having been painted over with the rest of the "nudities." But it appears plainly enough in every sixteenth century copy (Figs. 3, 4); and if the literature on the subject is mute, the reason is that scholars are delicate. There are disagreeable things that well-bred people don't notice—*guarda e passa;* or better still, don't look at all. It is as if Michelangelo had defaced the altar wall of the papal chapel with a provocation, like schoolboy smut on a public wall, which one punishes by inattention till they get



— Giuditio di michel Agnol fiorentino —

— Sonetto: —

O voi che reprendete .l, fiorentino
Considerate vn poco la pittura
vedrette che sta ben' ogni figura
Nella capella di Giesu Diuino.
Sta santa chaterina a capo chino
Nuda si come fecce la natura
Et Altri santi stanno co misura
A mostrar' i lor culi a don Paulino:
Il coglion di cesena come Pazzo
sta co li muorti per suo mal gouerno
tutt' Ascosto in' vn certo cantonazzo.
Vn' Altro sta ligato nel' Inferno
con' vna serpe che li morde il cazzo
per peccato di Rompere il quadrino:
Per questo in sempiterno
Christo condanna i bugironi Al foco
e star co' vna serp' Al tristo loco: —

— Finis —

Figure 6. Pasquino sonnet, contemporary transcription. Vatican Library, Ottob. lat. 2811.

around to cleaning it up. Yet, for twenty-five years, before overpainting buried that groin under folds of cloth, Sir Snarl towered with chewed genitalia over the sacristy door; and Vasari has had us believe that an elderly monsignore, chief of Vatican protocol, whom Pope Paul III wished to seat on a bishop's throne, was figured in this lewd exposure, and that his plaint about being so pilloried was dismissed with a joke. But there is no need to reject the whole yarn. Sufficient to bear in mind that our primary text is not Vasari's narration but Michelangelo's picture, and that it is by the evidence of the picture that the gossipry stands or falls.

At the unveiling of the *Last Judgment* Vasari was absent in Venice. Hastening down to Rome to lay eyes on the fresco, this "marvel of our century," as he calls it, he arrived when the city was already abuzz over Michelangelo's scandalous liberties; and there can be little doubt that he picked up a typical pasquinade, one of those unsigned lampoons that the wits of Rome used to affix to the battered antique marble group nicknamed Pasquino (Fig. 5). These lampoons, usually of a topical, political slant, flew from mouth to mouth, making the rounds of the city. They were assiduously gathered by diplomats concerned about public opinion—lending an ear to Pasquino was a way of keeping it to the ground. Moreover, collections were formed of transcribed pasquinades,[30] one such being preserved among the Ottoboni papers in the Vatican Library. And it is here that we find a contemporary transcript of a scurrilous sonnet aimed at the artist, a document necessarily contemporaneous with the initial unveiling of the fresco (1541), since Pasquino, unlike Vasari, is no historian and responds only to current events.

The existence of this caudated doggerel on the *Last Judgment* (a sonnet with an extra couplet in tow) was signalled in 1909 when Pastor, the chronicler of the popes, cited it in a discreet footnote.[31] Since then it has been repeatedly mentioned, but has been neither published nor considered in its implications; not even by Redig de Campos, whose monograph on the *Last Judgment* refers to this "*sonnettaccio*" as "*inedito, ma troppo libero per essere qui trascritto.*" He reports, however, that "the figure of Minos is here explicitly called 'Cesena,' " an unfortunate lapse repeated verbatim by subsequent scholars.[32] But in fact, though the sonnet does mention [Biagio da] Cesena, it declares unequivocally that we are to find him in some figure other than Minos (Fig. 6). Following is an English translation, beginning at the second quatrain:

> Here's St. Catherine bent over head first,
> Naked as nature made her,
> And the rest of the saints neatly disposed
> To show their butts to Don Paolino [i.e., Pope Paul III]:
>
> That mad ass of a Cesena
> Keeps the dead company for his misdemeanor
> Skulking in hole-and-corner.
>
> Another stands strapped in the Inferno
> With a serpent biting his cock . . .

So much for the conflation of Minos with the historical Biagio da Cesena. The phrase *un altro*, which introduces the beneficiary of the serpent's attention, is proof absolute that wherever Cesena lurked in the fresco, it was not in the person of Minos. And since that fat demon as a portrait of the *ceremoniere* is herewith ruled out, I welcome a suggestion dropped in a footnote nearly eight decades ago by Wolfgang Kallab: that we might recognize the old gentleman in the inquisitive baldhead at the right margin some three feet above the first cornice—with its garland of grey ringing the pate, this gaffer's poll does look home-

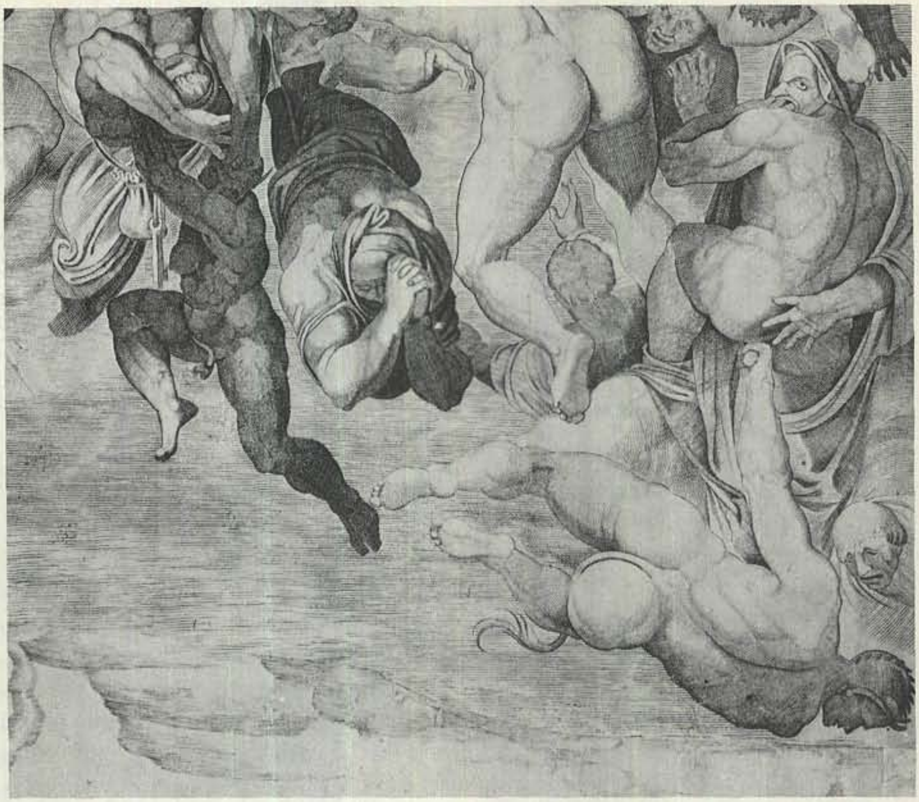


Figure 7. Niccolò Della Casa after Michelangelo. *Last Judgment*, engraving, 1543. Detail.

ly rather than apocalyptic (Pls. III, IV).[33] Kallab thought that further investigation was needed to determine whether it was autograph or a later addition, evidently because the image has faded and shows up poorly in black-and-white reproductions. But its authenticity is incontestable, for it appears in all early copies, beginning with Della Casa's engraving, published before the fresco was two years old (Fig. 7).[34] And the head still registers clearly enough in most color photographs, provided that one is cued to its lurking place. The effaced condition of the pigment indicates quick execution, perhaps as an addendum *a secco* (after the plaster had dried). This evidence of haste, and the head's marginal placement flush with the lower limit of that first three quarters which, says Vasari, had just been finished at the time of the papal visit, accords with Vasari's other remark that the Biagio portrait was painted *subito*, immediately after the visitors had withdrawn. In other words, it would have been executed without delay, in a mood as much of irony as of irritation. Furthermore, that bald kibitzer whom I propose to identify with Biagio—peering in from the Vatican side but thematically out of it, neither comminated nor blessed and belonging nowhere, so that the goings-on all around appear to be none of his business—that head as a portrait of the old monsignore is very funny.[35] Tossed off like an aside, it satisfies two essential conditions of wit—to be prompt and proportionate to the occasion. Alternatively, if we follow Vasari in reading the Biagio portrait into the head of Minos some ten feet below, which Michelangelo could not have painted until many more weeks or months had gone by, we impute a consuming vengefulness to the artist.[36] The vileness of Michelangelo's Minos, of the four-hundred-odd denizens of the fresco the nearest at hand, looming large over the door to the sacristy, gnarled, swollen, and obscenely exposed—this, as reprisal upon poor Biagio, charges the artist with brutal overkill, almost painfully humorless. Worse still, it accuses Michelangelo of trivializing his anti-Christ at the bidding of private rancor. Implicit in Vasari's anecdote—it is to his credit that he never troubled to think it through—is a profoundly frivolous notion of what a work of art means to its maker. I conclude, therefore, that Vasari's prized legend of an artist's revenge has been irresponsibly garbled, by himself first, and ever since by his readers.

> As St. Bernard saith: whereas be corners there is gladly filth.
> —*The Golden Legend*, englished by William Caxton, ca. 1470

In the literature about the *Last Judgment*, the figure of Minos (Fig. 3, Pl. II) is seldom acknowledged in its own right; one usually finds it cited in connection with one of three literary commonplaces. Minos appears either when the Biagio anecdote is retold, or (along with the ferryman Charon) as evidence of the artist's regard to Dante, or thirdly, as further proof (Charon again being the other) of Michelangelo's willingness to featherbed the Christian doom with phantoms from pagan myth. Not a word in the literature on what this putative Minos is doing, on the action of his left hand, his right hand, his sufferance of the serpent, or his relation to the anxious familiar with whom he is paired. The visual data are routinely ignored as too trivial to rival the dignity of a literary association. It has not even been asked whether the name the figure has borne since 1550 is compatible with its visual character or adequate to its role in the fresco.

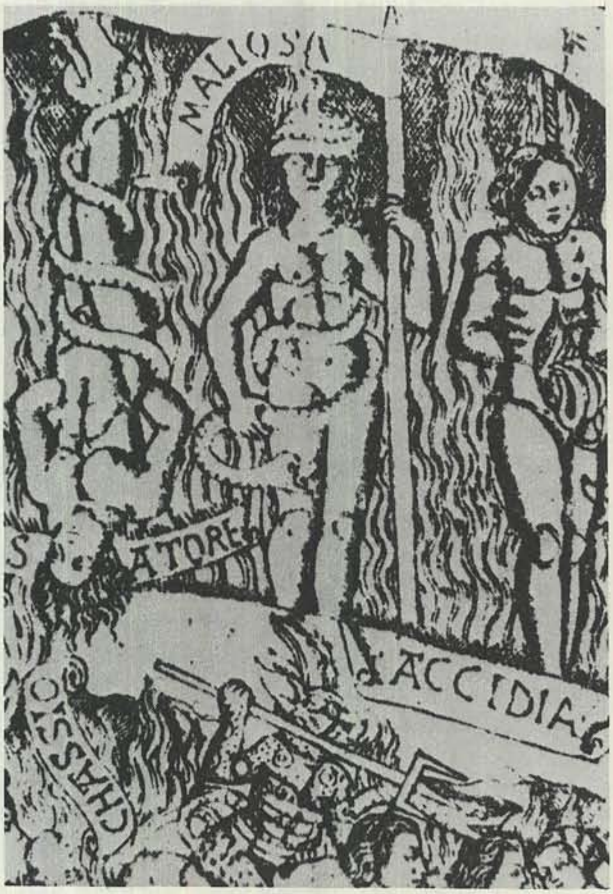
Why do we call him Minos? Because he is so designated by Vasari (1550 and 1568) as well as Condivi (1553). Yet the figure was not immediately recognized. The rhymester behind the Pasquino sonnet gave his *un altro* no name, and the religious who resented the presence of the mythical Charon at the Parousia found no Minos to weight their reproach.[37] In fact, the appellation of Minos was not heard until 1549, when Benedetto Varchi in Florence praised Michelangelo's corner keeper for recalling Dante's underworld judge.[38] Since the figure was one of the most rebarbative in a work which literati and lovers of art strove to defend against ecclesiastical censure, it seems likely that Varchi's invocation of a Dantean model was a way of giving it status; an appeal warmly seconded by Vasari as well as Condivi—the artist himself, as was often his way, keeping mum; he was serenely uninterested in work he had put behind. Yet there is some objection to the Minos equation, unless Minos is understood as simply personifying the power of Hell. In this sense, Dante's Virgil, intending to designate his abode in Limbo, says, "Minos binds me not" (*Purg.* I, 77). And it is in this sense again that Minos appears in a late fifteenth century Florentine mystery play, Feo Belcari's *Il Di del Giudizio*.[39] Varchi, however, in claiming an irresistible correspondence between the respective figures in Dante and Michelangelo, was being more literal. And his equation of Dante's underworld judge with Michelangelo's fiend rests entirely on a visual misreading—the supposed likeness of the latter's cincturing serpent to the tail that Dante's Minos wraps around him, the number of caudal coils indicating the circle of Hell to which a condemned soul is assigned.

> . . . when the ill-fated soul
> appears before him it confesses all,
> and that grim sorter of the dark and foul
> decides which place in Hell shall be its end,
> then wraps his twitching tail about himself
> one coil for each degree it must descend.[40]
> (*Inferno*, V, 7-12)

Not much of this vision is recalled in the fresco. Unlike any accredited judge, our cornered stander has no place to sit; he has no lost soul(s) quaking before him, and—gravest of deprivations—he has no tail. Indeed, his consorting snake wags its own, pluming it up behind his right shoulder, whence it descends to wind double about his abdomen, and at last rears its head between his thighs to receive his pudenda. Nothing here that relates the figure to Minos, though that title has effectively masked it for 430 years.[41]

If we must have a Dantesque source for this snake-entwined figure, we shall more probably find it in Dante-derived pictorial representations of the Inferno, such as the engravings inspired by the now destroyed fresco formerly in the Camposanto at Pisa. These include, in the top register of the Inferno, a female personification standing within the coils of a serpent which she, like Michelangelo's figure, steadies with lowered hand (Fig. 8).[42] Her upper hand upholds a banner inscribed (in one engraved version) *Maliosa*, old Italian for "one who

Figure 8. Florentine engraving, ca. 1460-1470. *The Inferno*, after fresco in the Camposanto, Pisa. Detail.



does evil." Despite the difference in gender, no more proximate image to Michelangelo's corner figure is known. I therefore suggest that the latter, too, is best understood as personified Evil, evil made the more willing by its appalling intimacy with the snake.

This intercourse with the serpent has been suppressed—physically by overpainting, conventionally by euphemism, ultimately by unawareness. But the true culprit is euphemism. More than a figure of speech, it blunts curiosity and cheats perception—as does the weasel word "nudities," handed down from the sixteenth century to palliate whatever there was of unseemliness in the fresco. The word serves to dispel the fact that the offense in the lower right of the field exceeds any flash of buttocks or genitalia. For the genitals here are dramatically engaged, a thing unheard of outside pornography. Admittedly, overpainting has dulled the offensiveness of the figure, leaving it merely dwarfish and ugly—Tolnay's "fat sadist." And one might ask whether a coarse detail, once covered over, ought to be aired again, whether any redeeming social value accrues from bringing it up. If earlier scholars did not actually overlook the motif (unlikely, since telltale copies have always abounded), they may have censored it out of reverence for the artist. Michelangelo, some may have felt, was reaching the end of his six-year labor. Approaching the hideous margent of Hell, he got carried away and committed a lapse of taste which there is no reason for us to follow him in. Hence, perhaps, the prevailing reserve, the reluctance to squeal on so great a man.

Such restraints seem no longer appropriate. For to prolong the silence from a sentiment of decorum is to continue the destructive aggression of the Tridentine popes against the integrity of Michelangelo's thought. We deplore the intolerance that ordered those "nudities" painted over; and think it just that the excellent Daniele da Volterra, who was made to dress scores of heroic nudes in loinbibs and underwear, went down in reputation as the "breeches painter," *il braghettone*. But we, too, who as historians have the estate of the artist in custody—in maintaining a censorious silence about his "Minos," are we not in collusion with the professional *braghettoni*, still pursuing the business of "covering up"?[43] What does it mean to have written a million words about the *Last Judgment* without ever confronting its unholy negative pole, that base extremity where Michelangelo's Prince of Hell plays cornerstone to the keystone in Christ?

Of the half-dozen references in the literature to the serpent-mouthed member, not one even tries to make sense. First in line is Pasquino's flat-footed sonnet; and its witless author, intent only on scolding the Florentine foreigner who had befouled the pope's chapel, misunderstood what he saw. Imagining the snake to be biting, he assimilated its ministration to the vexations of Hell, as others have done ever since. Few stopped to consider that a chieftain of Hell cannot be plagued by one of his own. Thus, to accommodate conflicting texts, Michelangelo's image was allowed to become self-contradictory. On the one hand, it supposedly represented the infernal judge named by Vasari-Varchi-Condivi. Yet, to accord with Pasquino, the figure was subjected to torment by a shrewd serpent, as thieves are in cantos XXIV-XXV of Dante's *Inferno*, the assumption being—*ut pictura poesis*—that Michelangelo paints as the poet dictates. And if the fit is imperfect, it must be that the artist was not careful enough. Despite the high rank our culture accords Michelangelo, the critical treatment of the fresco's right corner still cannot admit that the painter's sense of the depicted event would have controlled its parts by its own thoroughgoing necessity. We are assured over and over that Michelangelo's corner-lubber represents the Dantean judge of Hell, that he portrays Monsignore Biagio, and that snakebite troubles his penis.[44]

There is not the slightest reason to imagine him bitten. If the serpent attends to his groin, the Prince of Hell takes no hurt therefrom, for we perceive no sign of affliction, no reflex of discomfort. On the contrary, he stands snugly wrapped in his snake which his right hand sustains in position; and entrusts his private parts to its mouthing. In other words, it is a befriending serpent that hugs our fiend, female to his own sex.[45]

And the symbol is marriage—marriage not in the modern sense of an interlude recollected by divorcees, but timeless and indissoluble, like the union of the soul with the heavenly bridegroom in what was anciently called *hieros gamos*. Here in this unclean corner, advertising disgrace, the symbol is stood on its head, satanically inverted, as the Sacrament is in the sacrilege of the Black Mass. The serpent's glide adown that male torso betrays a connubial routine of fellation, the phallus received in its lodgment defining the spouse. Mating, as in mystic theology, but here under the negative sign of a bestial kiss, becomes a figure once more of perfect communion, perpetually consummated. Captain Ill is at his nuptials, wed to the serpent's mouth, fount of poison. Nor does it matter much what we call him—the Adversary, or serpent's mate, or spirit of the base corner. He keeps his post here as the counterpole to the fount of Grace. Hence his monumental stance over the lintel and his baneful proximity; not an impudence, but a morality.

The envenomed groin of Michelangelo's evil personification is not an expendable symbol. Though it pertains anatomically to one figure, it connects with the system at large by way of a geometric determinism. Trace a straight course from the fresco's lower right angle through the serpent's mouth, and produce the line upward as far as the wall allows: the resultant diagonal connects the lowest and highest points of the fresco (Pl. V).[46] The entire *Last Judgment* is crossed by an oblique axis, and on this axis the artist has staged the decisive moment, the central incident: Christ's imminent action aimed at the flayed skin which St. Bartholomew presents to his gaze (Pl. VI). One discovers with incredulous wonder that the course of the diagonal is set by the inclination of the artist's self-portrait within the skin. A hangdog face, dripping and limp (Fig. 9): but the sway of its axis projected upward and netherward joins the apex of the left-hand lunette to the right bottom corner. And the artist has pinned the midpoint of his visage precisely at centerpoint between zenith and nadir. Such metric ratios do not materialize accidentally. To put it literally, letting metaphor fall where it may: it is the extension of the self's axis that strings the continuum of Heaven and Hell.

Nor is this all. Upward from the face in the skin, the diagonal passes unerringly through the wound in Christ's side—the source of the Sacraments and of the Church.[47] Higher still, it marks the diameter of the Crown of Thorns, held forth by a buoyant angel. And only then, after intersecting that point on the triumphant Cross where the head of Christ rested at the Crucifixion, does the line touch the vault of Heaven at its visible peak. Meanwhile, the same trajectory, hellward bound, links three foci of deepening degradation. Down one step from the artist's self-portrait it pinpoints the stricken shameface of the first of the castaways; and from this gruesome impaction of guilt plunges on to the ultimate desecration, the viper's mouthful. Is it not strange to see such bestiality trued with Christ's wound and crown, and again with the artist's own skin? The great diagonal emerges as a moral-theological vector, discharged from the artist's self-image two ways—its descent charting his consciousness of demerit; its ascent, his Christian hope.

There is yet more. The armature of the composition mounts a counter-diagonal on the predominantly female side of the fresco, and this too implicates our right-corner figure by pairing it with a remote counterpart as with the other foot of dividers. Wölfflin observed long ago that "the articulating lines [of the design] are two diagonals, which meet in Christ." He recognized this convergence as a tectonic device, and noted that "it would not have been possible to give emphasis to the chief figure without this symmetrical order."[48] Now, eighty years after Wölfflin, we can refine and expand the analysis: first, by tracking the counter-diagonal in its path and, second, by observing its operation within Michelangelo's structure of meaning. The process will require us to consider certain details in far greater resolution than Wölfflin's generation thought proper or necessary; but there is no alternative if the turbulence of the image is to give up its pattern.

We recognize at the outset that no symmetrical ordonnance in Michelangelo's composition is likely to be rigid or absolute. The same contrapposto that sways the axiality of his single figures operates as well in an aggregate such as this fresco, where both the "axial" Christ and the "centralized" cluster of angelic trumpeters are displaced in opposing directions. Hence, the bilateralism of Wölfflin's "two diagonals meeting in Christ" is inevitably unbalanced by a major and a minor diagonal, of which the latter appears less pronounced, being shorter, steeper, and intermittent. Nevertheless, it runs a precise rectilinear course.

The counterdiagonal (Pl. VII) is laid down by the long arm of the helper who stoops, midway in the left half of the fresco, to haul two souls up by a rosary. Structurally, this helper plays counterpart to the shameface figure at right, so that, as the major diagonal passes through the brow of despair, its complementary coincides with the reach of salvation. Bisected (at elbow joint) by that stretch of arm, this other diagonal has its beginning, middle, and end, like a narrative sequence. It originates in the left hand of Christ, the auspicious hand that draws the elect.[49] Its terminus falls at the base of an awesome figure: *la Morte*, personified Death centered on the field of the Resurrection, the only figure in the vast fresco (discounting three grimacing fiends) that stares at the beholder (Pl. VIIIa). Unfortunately, the lower part of this swathed three-quarter length skeleton has been so darkened by candlesmoke that we must resort to the copies to retrieve Michelangelo's thought, but the thought is clear (Pl. VIIIb): Death stunned to discover herself in labor. From within the folds of *la Morte's* shroud, from forth her fatal loins, a head and hand emerge fully fleshed, magnetized along that counterdiagonal by the hand of Christ: born of death, resurrected. And as *la Morte* brings forth, she, like her male counterpart in the lower right corner, is genitally engaged. And Christ thrones at the apex while Death and Devil compass the ground below.

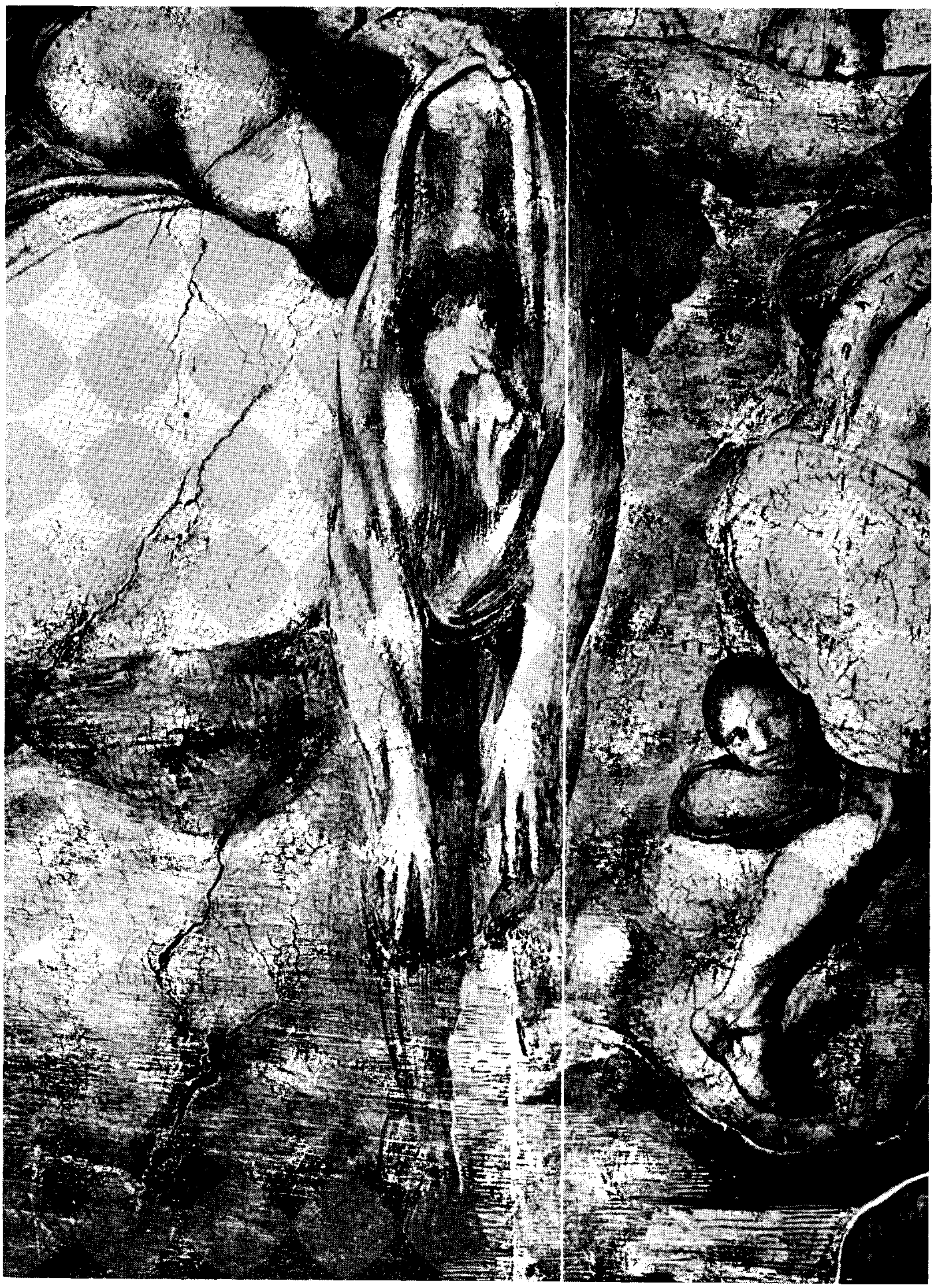


Figure 9. Michelangelo. *Last Judgment*. Detail of self-portrait in flayed skin.

At this point a skeptic might plead that our proposed counterdiagonal from Christ to man vivified is but one line willfully torn from a welter of multidirectional forces. This is a fruitful objection, for the line isolated is entwined in a complex visual polyphony, not truly seen until it is recognized as one counterpoint among several themes intersecting. Two of these themes concern us immediately. Among the resurrected who rise in the zone between the two lower cornices, some ascend on a straight upward course, and this is the dominant theme. But their perpendicular motion is intercrossed by a threefold event—the response by some of the newly risen to Christ's summoning hand, forming a triple convergence, as though the undead were being attracted by invisible cords (Pl. IX). The innermost of these lines of attraction leads from Death's loins. The outermost begins at extreme left, at the juncture where the first cornice of the adjoining side wall abuts on the depicted horizon. Here a small figure with arms outflung springs up ecstatically, canted to aim direct at Christ's lowered palm. The continuity of this outer diagonal is soon submerged by the perpendicular risers, but it thrives again (at main cornice level) in the foreshortened backview of a man coasting toward two arms extended for his reception. Though discontinuous, the diagonal launched at the limit of the horizon persists. And there is, finally, an intermediate oblique; it runs through the paired figures surging Christward on an irresistible updraft above the point where the horizon dips centerward. The bias of these graveclothed figures (Fig. 10) forms the third of three spokes.

Proof that this triple convergence was most carefully plotted comes unexpectedly from the lower limbs of Christ and the Virgin (Pl. VI). This should cause some surprise, for we do not normally expect the legs of a figure to do more than round out its posture.[50] Whoever heard of thighs and tibias as conveyors of Grace? Did not Goethe declare, "Every ethical expression pertains only to the upper part of the body"?[51] Yet, Michelangelo has disposed the right thigh of Christ and the lower legs of the Madonna as partial radii centered on Christ's welcoming hand—three lowly limbs fanning out to guide the reentry of the three homing convergents. The innermost line, drawn up from Death, is piloted to its goal along Christ's right thigh; the two outer diagonals arrive by way of the Virgin's legs, whose strange angulation, adjusted for the reception of remote signals, becomes for the first time intelligible.

It begins to dawn on one how much ranging and structured attention is needed to comprehend Michelangelo's dramatis personae. Impressive enough individually, they also serve as poles and vectors and links in chains of causation. Neither the Christ nor his consort—nor the helper with rosary receiving his charge by rectilinear transmission from Christ's hand and thigh—indeed, few of the major figures scattered across this vast surface are to be understood in isolation. A given figure may be identifiable with a certain corner, but "corner" is a relational term. Corner of what? The character of Michelangelo's figures tends to be codetermined by site, and that site in turn may be defined by the coordinates of the field, by abutting architectural features[52] or as the nexus of power lines. Though the figures are surely disposed according to overt needs of narrative and design, their distribution does not proceed on neutral terrain. The ground itself is prestructured, like an escutcheon, or better, like a territory under military command, where the objective is not so much to deploy human bodies as to garrison strongpoints and sensitive borders by means of bodies.

Accordingly, in the *Last Judgment*, structural accents, geometric terminals, lines of communication that become trains of thought—all stresses within the field solidify as bodies in action. But this overview of the painter as strategist was hardly available to the artist's contemporaries, who parsed Michelangelo's fresco piecemeal, admiring individual figures and groups of figures as so many feats in the rendering of foreshortened anatomy. The wider response to Michelangelo's thinking belongs to this century. Only to us is it given to see the fresco as a system of far-flung interactions wherein discrete figures, for all their concrete humanity, operate under organizational modes that are larger than anatomic. The fresco resists easy looking and simple description because its characters are overcharged, overdetermined. Firmly emplaced, they are at the same time conductive, like chain reaction events; individualized one by one, though enclustered; self-involved, yet subsumed.[53] And this applies with especial force to our cornered snakecharmer. If we said earlier that this so-called Minos should be seen whole, intending innocently enough that the figure should be seen as more than a portrait, the scope of that wholeness is still unassessed.

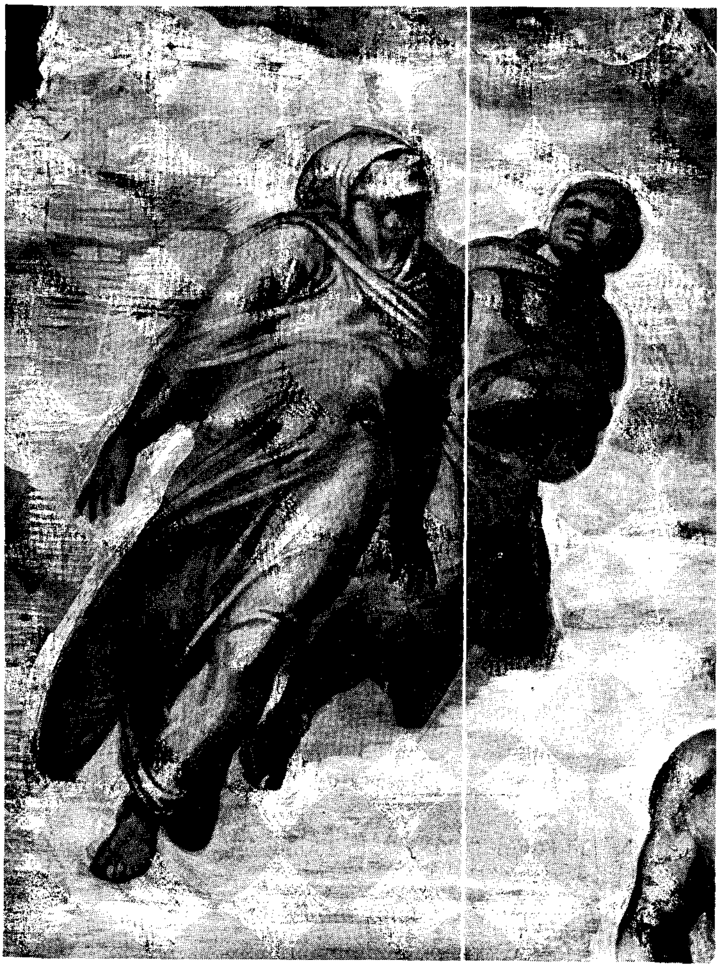


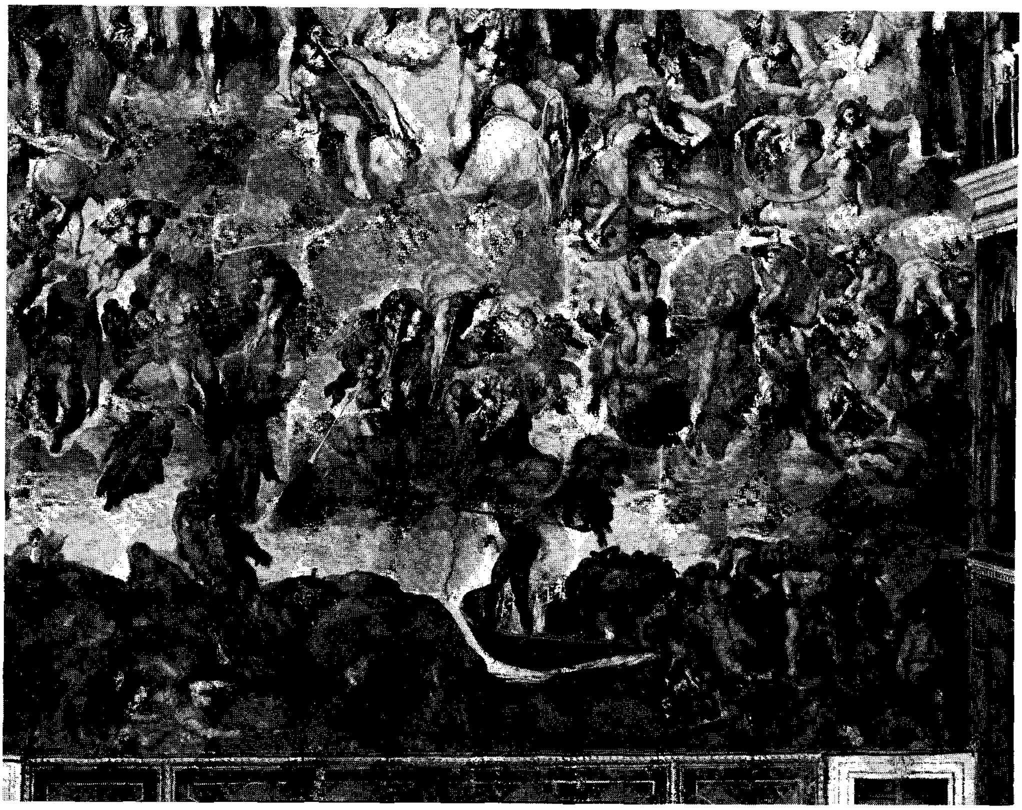
Figure 10. Michelangelo. *Last Judgment*. Detail from Resurrection.

We have seen cornered "Minos" at the sinking end of a slope, annexed to a thoroughgoing diagonal (Pl. V); and then again in correspondence with Death, triangulated with Christ (Pl. VII). We have yet to align him, inward along a base horizontal, with the flame-filled cave at bottom center (Fig. 11).

His connection with it is negative. While his minions are busy welcoming the condemned, he—unlike Dante's Minos who sorts each incoming soul individually—turns his back on the lot to make one left-handed gesture. The gesture is surreptitious, so marginal that color reproductions of the *Last Judgment* usually crop it away. Yet, as the last operation performed in the fresco, the artist must have given it thought. The cornered one is, in fact, pointing to his left—not downward into some lower pit, but sideward with leveled index (Pl. II, Fig. 3). And so momentous is his pointing that his amazed adjutant, the wild-eyed demon behind him, reacts in consternation by pointing again—the other way, toward the arrivals in Charon's barque. If this bifurcation of gestures, this disaccord between the knowing chief and his troubled henchman, has any meaning, then the issue should be the whereto of the boat's cargo. As directed by the fiend in the corner, the whole catch of convicts is being diverted from that central cave; whereby the latter is identified for us as the place to which the rejected ones are not being sent.

Unfortunately, this most smoke-blackened part of the fresco, normally hidden from sight by six massive candlesticks flanking a cross, has not received the attention which, in the Christian scheme of things, is due to Hell. Writers usu-

Figure 11. Michelangelo. *Last Judgment*. Detail of lower zone.



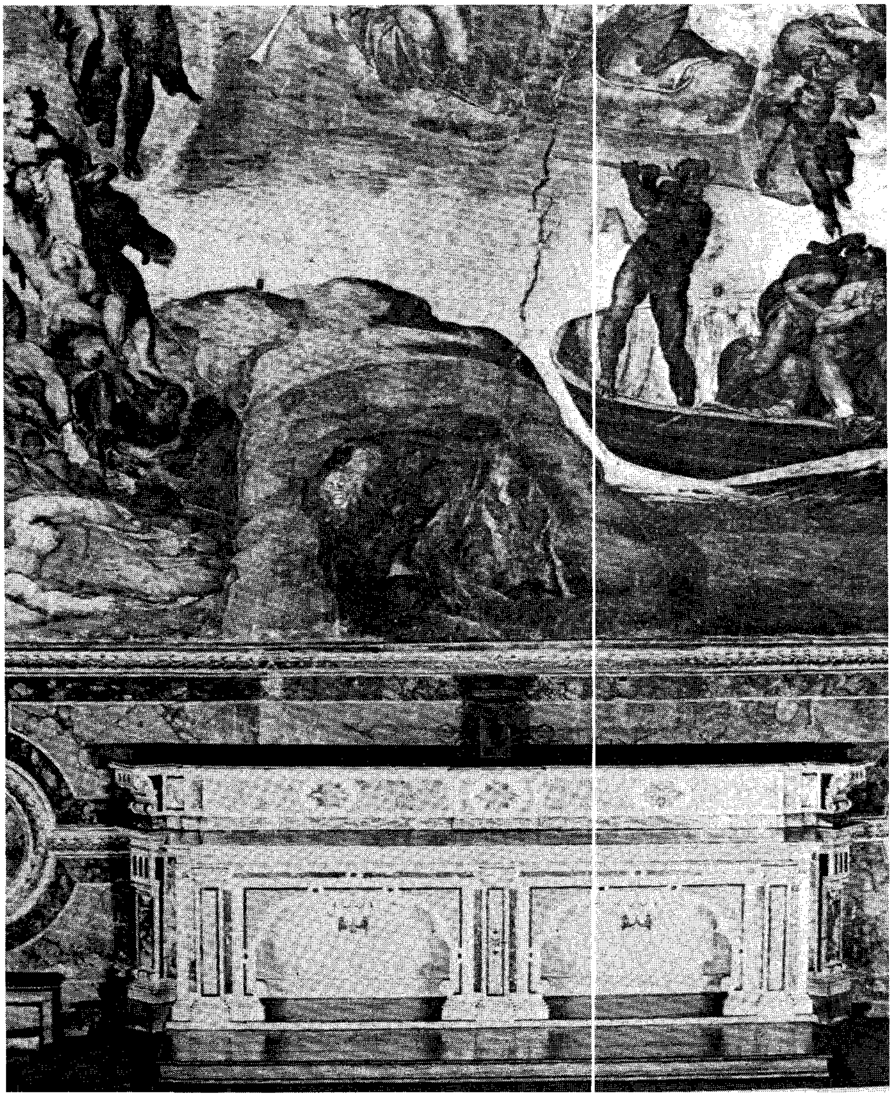


Figure 12. Michelangelo. *Last Judgment.* Detail of hellmouth and altar.

ally pass it by, and the few who refer to it do not agree. One prominent scholar has dubbed it Limbo, though Limbo ought to contain neither devils nor flames. Others, since the beginning of the nineteenth century, have called it Purgatory—on better grounds, since Hell proper appears to be placed, as convention requires, at lower right.[54] Indeed, the two scenes seem sufficiently separate and diverse in scale to invite separate designations. Most scholars, nevertheless, call the central cave *Höllenberg*, mound of Hell, or hellmouth (Fig. 12). Meanwhile, no full description of it exists, and the case of the innominate cavern has never been brought to court.

Confusion in art historical scholarship usually reflects an ambiguity in the image. In the present case, ambiguity is engendered by the unaccountable doubling of two disparate symbols that apparently stand for the same entity. About the event in the corner there is no argument; it evokes the brink of Hell by its location, its fires, its eager demons, and not least by the anguish of the con-

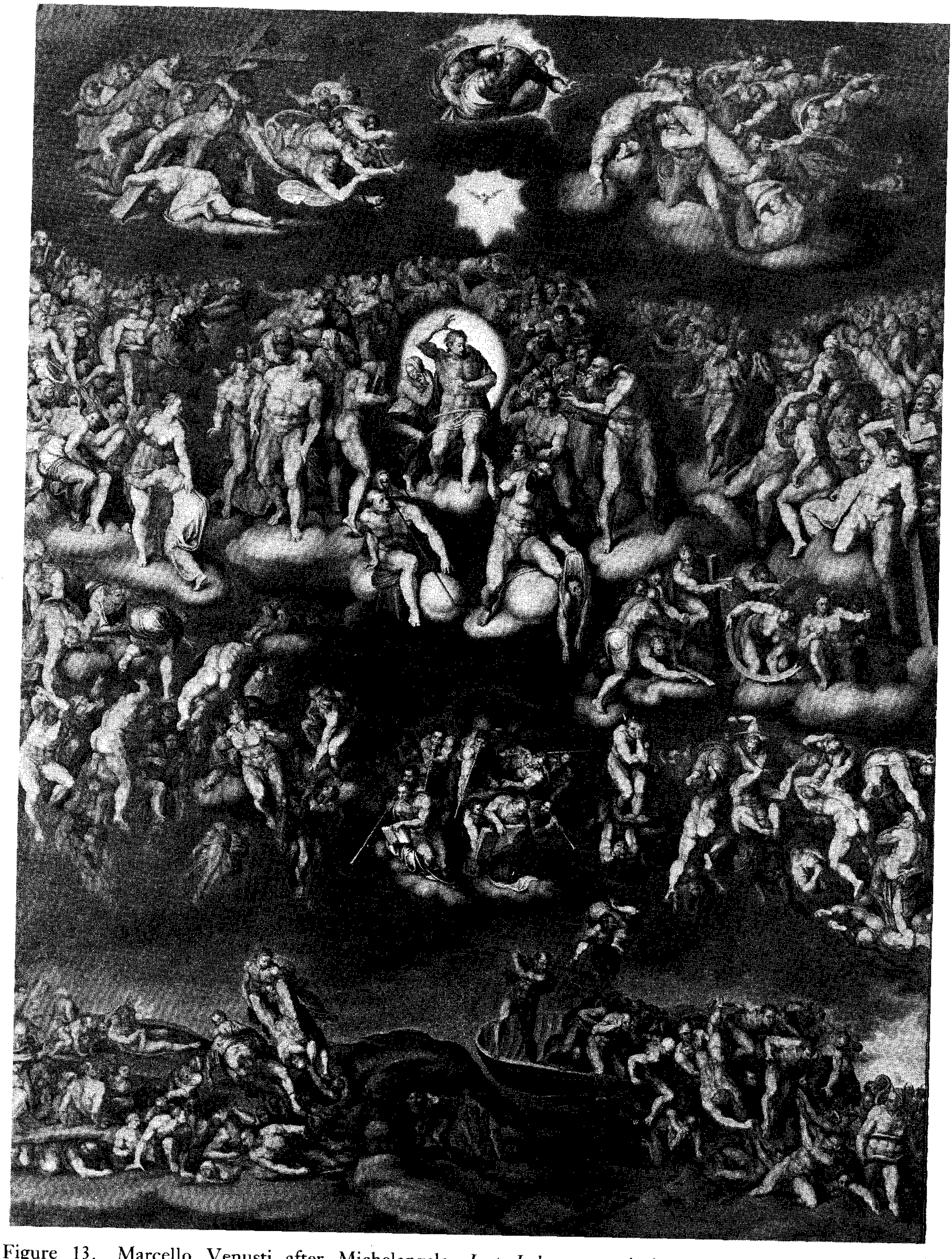


Figure 13. Marcello Venusti after Michelangelo. *Last Judgment*, painting, 1549. Naples, Museo di Capodimonte.

demned.[55] Yet the "mouth of Hell," open to us as if by cross section, is walled off to the right and stacked on the base of the fresco, so that it offers the condemned no possible access. Two of the latter, steeped underground near the water, are already immersed in flames to their necks—tasting hellfire without having passed through Hell's porch. And every further detail confirms the dissociation of cave and corner. Down at rock bottom a thin strip of ground seems to connect them, but where this strip touches center, it climbs up the side of the grotto and passes behind to merge with the field of the Resurrection. Hellmouth itself remains unreceptive, and all the action to the right of the cave strains away from it: the steersman's thrust, the drift of the boat, the discharge of the condemned, the tugging of demons. There is even a corroborative pentimento, perceptible to the naked eye, where the painter curtailed the boat at stern and bottom with an overlay of white pigment. We cannot be certain what prompted this afterthought, but, whatever the motive, the clearing between cave and boat confirms again that the latter is being diverted, sent otherwhere than the cave.

Of this puzzling anomaly the literature has taken scant notice. When center and lower right are respectively named "hellmouth" and "shores of Hell," the wording, by holding on to one constant term, joins together what Michelangelo put asunder. Yet we have overwhelming proof that this sundering disturbed the artist's contemporaries. The evidence does not, of course, take written form, since the early commentators resist entanglement in detail; it resides, rather, in the determination of Michelangelo's copyists to correct an intolerable contradiction—a hellmouth averted from the condemned. The copyists seek to repair the parting of the two scenes by desegregation, trying to make one thing, one concentrated catastrophe, of the central grotto and the delivery of the damned. Their rescaling and shifting of the original groupings indicates better than any vague verbal censure exactly where Michelangelo's vision was unacceptable. Thus in Marcello Venusti's painted copy of 1549 (Fig. 13), hellmouth, withdrawn from the lower margin, is given an underprop of wide barren strand to share with the shore at right. Later engravings perpetuate this interpolation, and with it, the fiction that the fresco itself had originally included a vacant shelf, three feet deep, under its present threshold.[56] Even more telling adjustments appear in Martino Rota's print of 1569, which served for more than a century as the standard representation of the Sistine *Last Judgment* (Fig. 14). In Martino's revision all proportional ratios are cunningly altered. Michelangelo's pinched nook of Hell swells to a copious corner. What had been meant for a foothold spreads out in the engraving, gains ground, doubling its plot; glowering Charon, newly centered in the composition, assumes both the scale and the axiality of the Christ; and—most revealing for what was felt to require correction—Michelangelo's shunted souls are beached in the grotto's immediate vicinity (Fig. 15). Now at last the infernal maw gapes to ingest what the fresco sweeps into the corner. Yet this is precisely what the original structure forbids: the fresco leaves no way for the ejecta from Charon's barque to feed into Hell's mouth.[57] This, no matter how baffling, must form the basis for any responsible reading of Michelangelo's meaning: the punishment of the condemned is shown to us as removed from Hell proper—if indeed Hell is symbolized in the central cave.

It burns within like a furnace. All but one of its incumbents (owing to the fresco's condition they have to be studied in early copies) are fiends, horned and

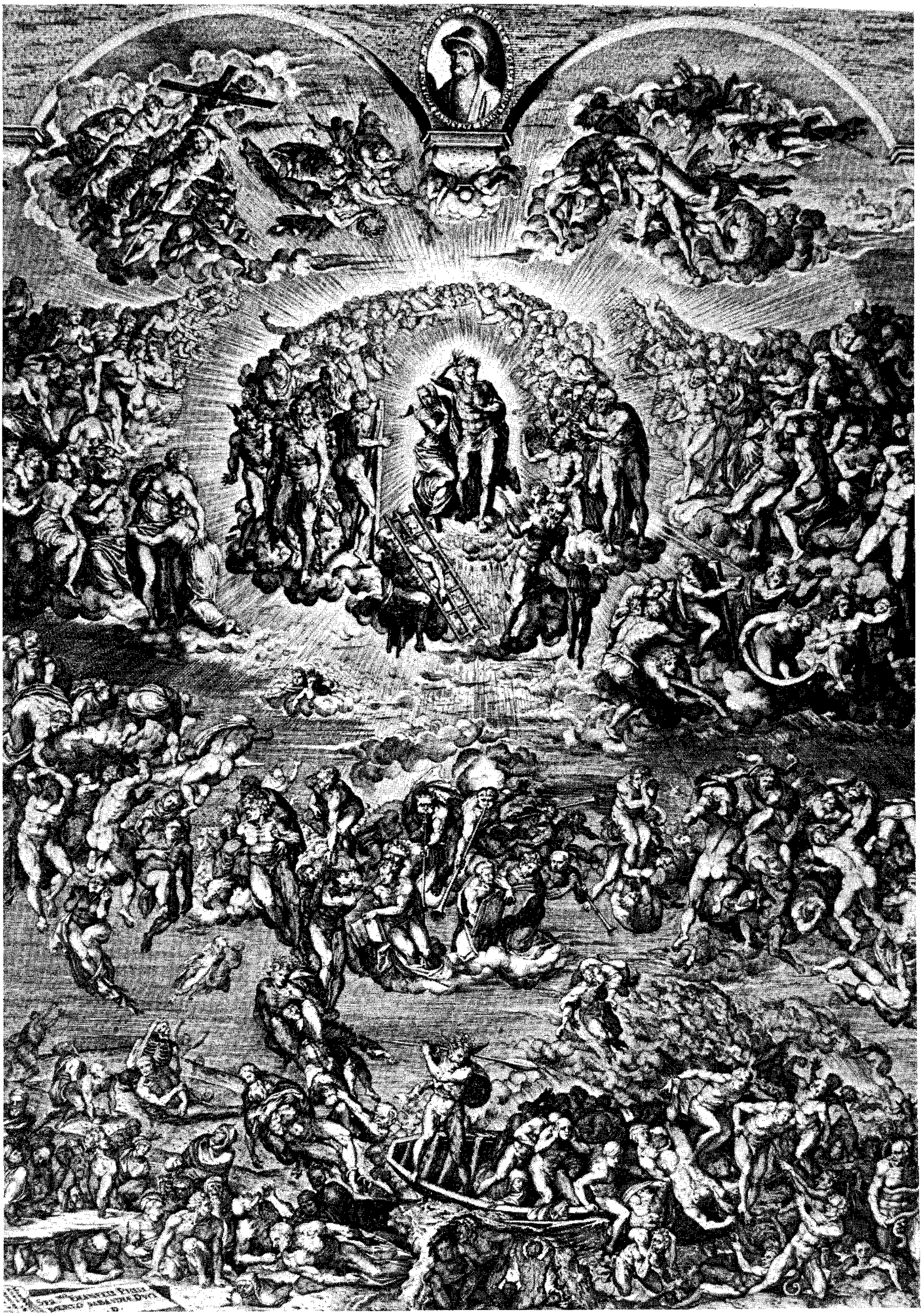
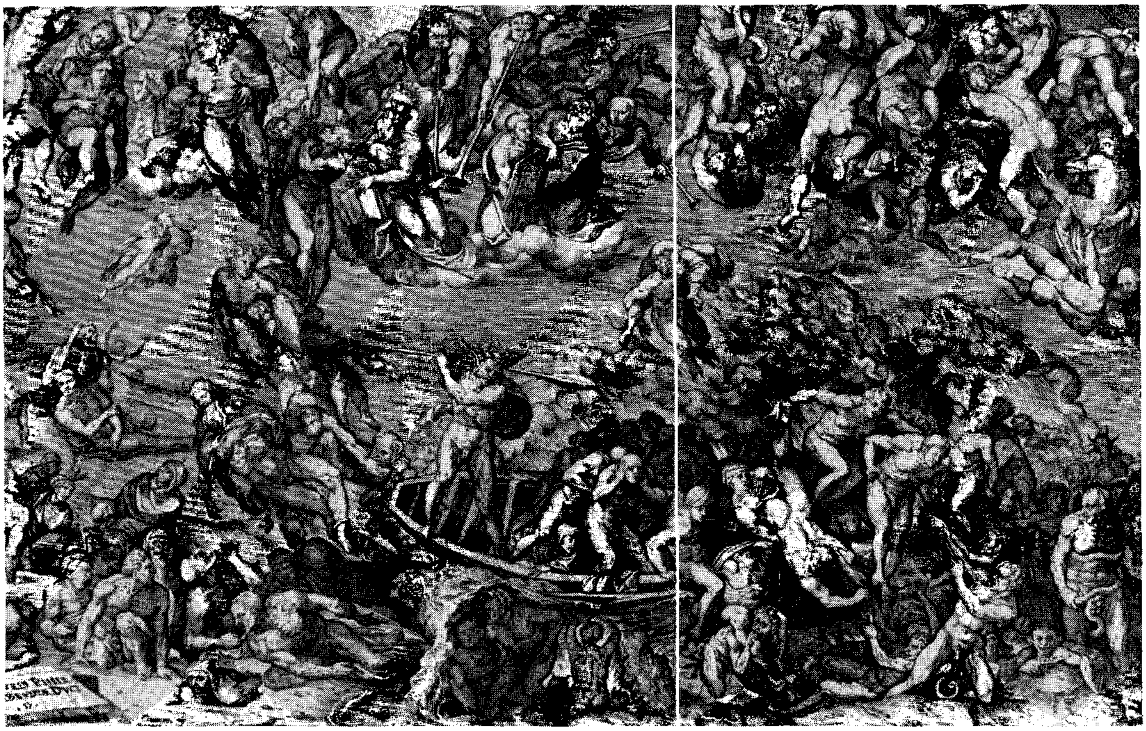


Figure 14. Martino Rota after Michelangelo. *Last Judgment*, engraving, 1569.

claw-footed (Fig. 16); and they're aghast. The cause of their perturbation seems plain, since their den is being depleted. Through a breach in the left-hand wall of the cave, angels seem to be rescuing former inmates, while demons cling ineffectually to their hair or to coiled snakes lashing their ankles.

But is this description correct? We touch here on a characteristic disagreement in the Michelangelo literature—characteristically unacknowledged. Stendhal, who took the cave for Purgatory, saw its devils dismayed for having no one left to torment: "*Les derniers pécheurs qui y étaient épurés en sont tirés par des anges. Ils s'échappent malgré les démons qui veulent les retenir.*"[58] There is no question in Stendhal's mind that the angelic rescue operation involves the cave's former inmates. Yet Steinmann and Feldhusen espouse an alternative interpretation, believing that the contested souls were never yet inside the cave.[59] In their view, the devils had been waiting in ambush for the emergence of the resurrectees; at which moment they sortie to drag them hellward, but are prevented by the timely intervention of rescuers. In face of such disagreement it is usually best to ask what it is in the work that permits such difference of opinion; the answer being, as usual, that both views are partly right, since the devils are shown as incapable either of gaining or keeping. Near the base of the fresco, a horizontal male figure appears to be issuing from the cave with one trailing foot still within (Fig. 11). But above its left calf two demonic hands (scarcely visible in reproduction) tug at the shroud that underlies the awakening figure adjacent to Death; and this is the ambush theme. Ambush is still implied in the next group upward, where the rescued soul (the one with the snakes at the ankles)

Figure 15. Detail of Figure 14.



remains partially wrapped in cerements, such as are worn neither in Purgatory nor Hell. But in the uppermost group, where a naked man is held upside down under the knees while a goblin clings to his hair, we surely see one being pulled out of Hell against diabolic resistance. Given the group's oblique disposition, the "whenceness" of this saved soul seems unmistakable.

A weightier argument, which the ambush-interpreters left unconsidered, derives from the fact that the leftward wall of the grotto is fissured, a trait on which all early copies agree. Since a breached wall, even if usable as a sally-port, cannot be a feature of Hell's original fabric, it must indicate some recent violence to its structure; the purpose of which can only be the retrieval of those it held captive. Meanwhile, further left, crowding parturient Death, the resurrected start from their graves. Thus is verified the Apocalyptic prophecy: "Death and hell gave up their dead that were in them" (Rev. 20:13). One could not wish for a closer textual illustration.

Yet, the designation of the central grotto as Hell presents difficulties. Inside, near its right wall, we descry a sole human presence, the nude backview of a man. He reaches inward, like one wanting to dive into the flames. Is he one of the avid damned craving his penalty—"for divine justice spurs them so, that fear is changed into desire" (*Inferno* III, 125-6); or, as St. Catherine of Genoa put

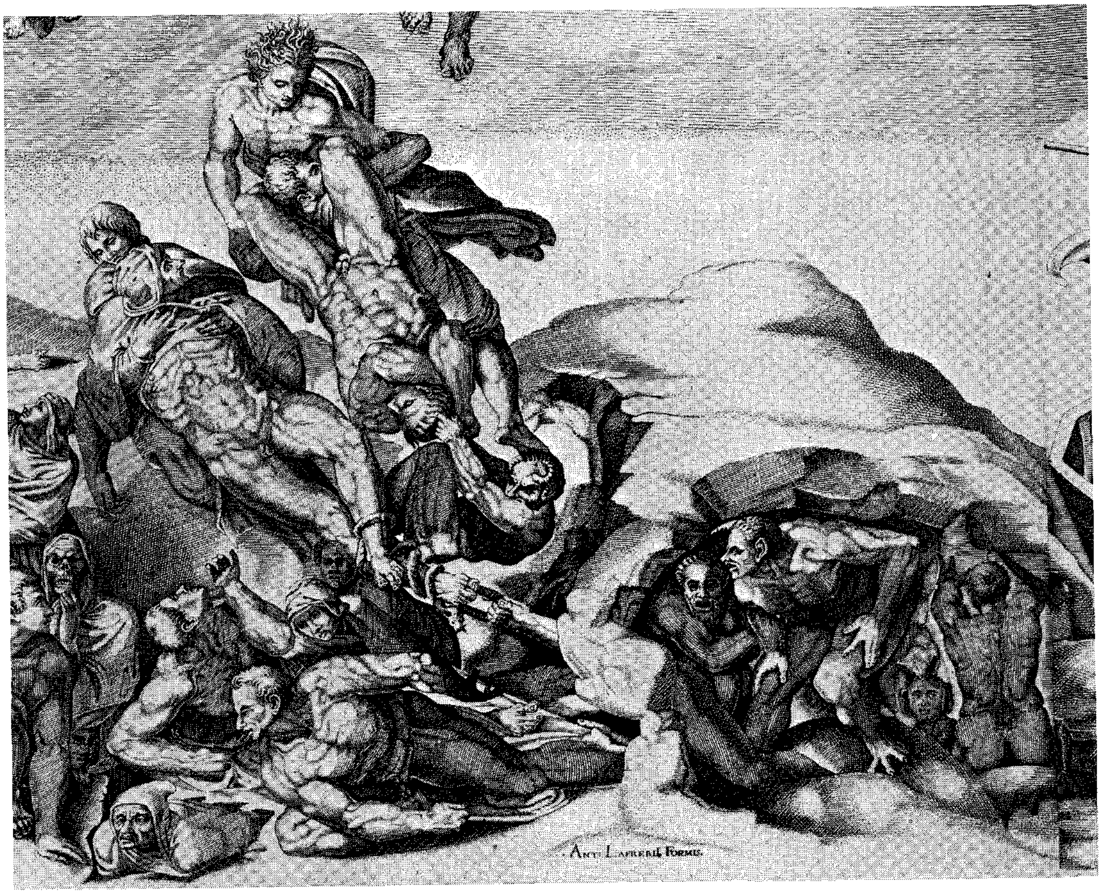

ANT. LAFRERII FORMIS.

Figure 16. Nicolas Beatrizet after Michelangelo. *Last Judgment*, engraving, 1562. Detail of hellmouth.

it (ca. 1500): "The soul [that was in mortal sin when leaving the body] casts itself by God's ordinance into Hell as into its proper place."[60] Perhaps so, but consider the implication. With one hellbound soul plunging in while an angel at Hell's broken flank is shown pulling one out, Hell's entrance becomes a revolving door. Is the artist presuming to question the dogma of Hell's finality?

Let us assume instead that the cavern was meant for Purgatory. Several advantages follow. Its separation from the infernal right corner would be explained. Secondly, the plunger into purge fire becomes conformable to the soul encrusted by former sins: "Seeing in itself the impediment which can be taken away only by means of purgatory, it casts itself therein swiftly and willingly." (Thus, again, St. Catherine of Genoa, though her vision allows no demonic company.) Thirdly, the struggle of angels and devils for human souls evokes earlier purgatorial imagery. It is in Purgatory that Dante hears Buonconte recall such a contest: "The angel of God took me, and one from Hell cried: 'O thou from Heaven, wherefore robbest thou me?' " (V, 104-5). And the contest motif stands for Purgatory in illustrations to the *Revelationes* of St. Bridget (e.g., those attributed to Dürer in the edition printed at Nuremberg in 1500): souls steeped in fire are drawn forth by angels, while demons hang on to their limbs.

Finally, a purgatorial interpretation of the central cave might explain its surprising adjacency to the altar (of which more will be said below). A purgatory adjoining the altar would inevitably evoke the dependence of its suffering souls on the Masses offered for them by the living. According to one notion (traceable to St. Gregory and popularized in the thirteenth century by Vincent of Beauvais), every Mass celebrated releases another soul from Purgatory.[61] And a Tridentine decree reaffirms "that there is a Purgatory, and that the souls there detained are helped by the suffrages of the faithful, but principally by the acceptable sacrifice of the altar."[62]

Here we are brought up short. While the *Last Judgment* was taking form, the existence of Purgatory was one of the most hotly debated issues in Western Christendom—argued in every barber shop, complained the Bishop of Modena. As Cardinal Sadoleto put it in 1544 (referring to his lost treatise *De Purgatorio*), no other element of Catholic dogma stood in greater need of defense.[63] For wherever Christians embraced the doctrine of justification *ex sola fide*, Purgatory was called into question. To many loyal Reform-minded Catholics before the Council of Trent, the dogma was a mere superstition, a medieval accretion unfounded in Scripture and rightly rejected by the Eastern Church.[64] The Evangelicals within the Church of Rome—though they would not echo Luther, Zwingli, or Calvin in denouncing Purgatory as a fabrication and a lucrative fraud—simply ignored it; and it was their religious persuasions that Michelangelo shared. Symptomatic of his attitude is a simile in one of his poems, where the survival of rock in a fiery kiln is compared to "a soul purged, returned from Hell *(da l'inferno)* to Heaven"; which Michelangelo's Catholic editor explains as referring to Purgatory—as if Michelangelo, lifelong reader of Dante, had been unaware of the difference between Inferno and Purgatorio.[65] The point is rather that in the poet's imagination Purgatory had ceased to exist. Yet, if we hold to the proposed purgatorial reading of the cave in the fresco, we should have to conclude that Michelangelo was here entering the debate as a controversialist for the conservative party. In view of his known religious attachments, given his silence on Purgatory in his poetry and in his correspondence concerning deaths in the family,[66] a strong focus on Purgatory within the fresco seems too far out of character.

And there are graver objections. Purgatory, though abrogated on the Last Day, has no place in the iconography of the Last Judgment. Since its interim fires operate on disembodied souls prior to the General Resurrection, Purgatory does not enter into the eschatological vision of the Last Things. Furthermore, as a dogma of recent growth, the representation of Purgatory in art was rare and uncertain, and the reports of its two outstanding witnesses, St. Bridget and Dante, were contradictory. To identify the fresco's central grotto as Purgatory we would have to believe that Michelangelo spurned Dante's familiar vision of the seven-storey mountain, which contains no devils and little fire, to follow instead the Brigittine model of a flaming Purgatory serviced by fiends.[67]

In view of these obstacles and the prospect of belaboring theological subtleties foreign to Michelangelo's temper, that intuition seems best which sees the grotto behind the altar opening on Hell itself. But then it must be Hell in the generic sense, before it was anatomized by the Schools; a conception of Hell indifferent to its scholastic compartmentalization into the four parts of Inferno, Purgatory, and two divisions of Limbo.[68] There is no such Hell-splitting in the piety of the *Spirituali* with whom the artist conversed; no trace of it in his poems, no clear sign of it in the fresco.

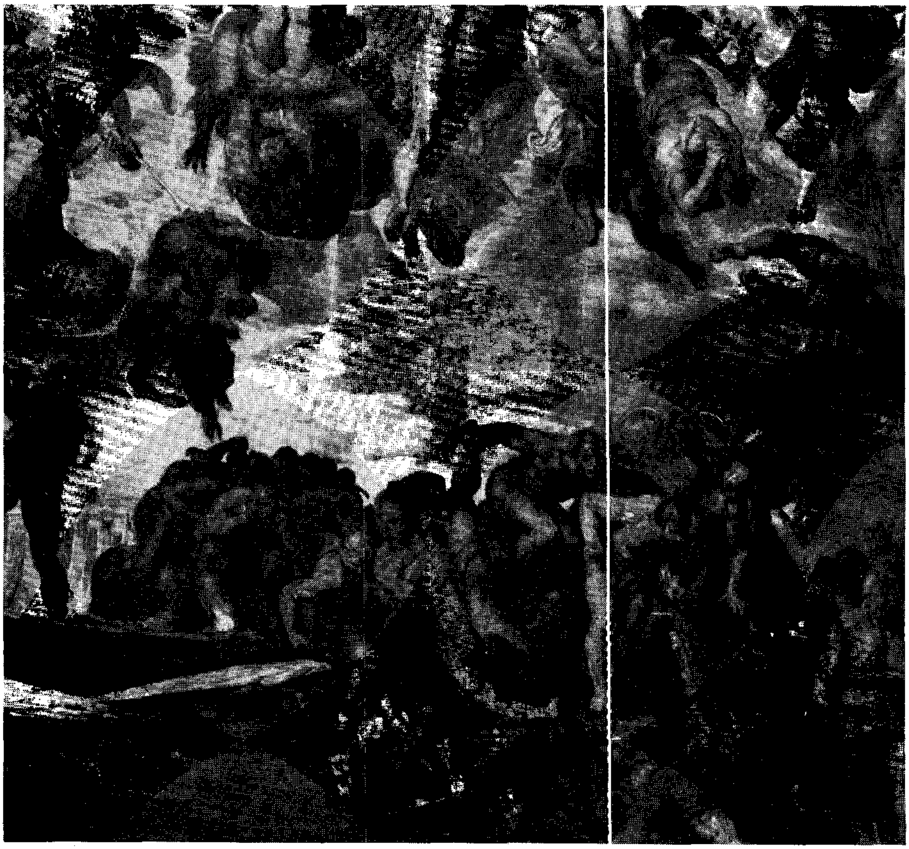
What the fresco displays behind the altar is rather the Hell of Scripture and of the Creed. And to convey its full import the artist has enlisted nothing less than the whole of the given system. The redemptive acts of the Crucified who broke the power of Hell and rose from the dead—these acts are charted again on the Chapel's own axis in the sequence from horizontal to vertical—from tomb-altar to harrowed Hell to Second Coming. Hence the pivotal placement of Hell in the fresco—leveled with the celebrant priest, and on a shared perpendicular with Christ overhead.[69] In its unprecedented and crucial centrality, the cave in the fresco has the effect of dramatizing the inmost sense of the altar. The altar, itself unmoved, comes to be seen athwart the longitude of the chapel, at whose end yawns the ineluctable cul-de-sac of Hell's mouth. Say that the altar—the event enacted upon it, Christ's sacrifice—becomes a parapet protective against the abyss, the saving barrier between the worshipper and perdition. Surely the operative power of painting *in situ* was never more compellingly realized.

Hell overruled for mankind's redemption must then be the simple meaning of the exposed cave, a meaning inherent in its manifest features: its interior fire, its human exponent facing the flames, its confounded demons whose charges are being withdrawn; its fulcrum position between the loci of Christ victim and Christ triumphator; its arched top in depressed mimicry of the round of saints about Christ; and, finally, its abrupt insulation from the harvesting of the damned.

What should this harvesting signify if not Hell again (Fig. 17)? But perhaps the depicted event is not a place. For if there was ever a painting that allocates sites without localizing their whereabouts, it is surely this fresco; which may be the reason why Michelangelo's "Hell"—already fabulous in its evocation of Charon and Acheron—seems so unsubstantial and plotless, blazoned at sinister base, but with no portal, no architectural fixity. The question must be left open, but it is at least possible that Michelangelo was here representing a state of mind, the psychic condition of anxious sin—thematically distinct from that Hell of Scripture which Christ overcame. At any rate, we are given no simple scene, and the more one dwells on its details, the less orthodox it becomes. Almost it reminds one of Erasmus' bold statement in the *Enchiridion* of 1503: "The torments of Hell about which the poets have written much, are nothing but the perpetual anxiety of mind which accompanies habitual sin."[70]

I have elsewhere referred to Michelangelo's treatment of the Last Judgment as "merciful heresy"; and the phrase has led some to object that it "implies a will on the artist's part to flout the ecclesiastical establishment."[71] This is not so. In our period, before the post-Tridentine distinction between material and formal heresy was clearly drawn, "the will to flout" was not a necessary condition for heresy. Deviant beliefs (such as Cardinal Contarini's *duplex iustitia*) were declared heretical, irrespective of the holder's subjective will. It is precisely the character of the Italian Evangelical movement of the 1530s to have professed, with no rebellious intent, doctrines that were subsequently condemned. Juan de Valdes himself died convinced of his orthodoxy. And the *Spirituali* of Michelangelo's religious circle, Valdesian (ultimately Erasmian) in persuasion, firmly believed that their understanding of Christian doctrine was true Catholicism and would be so affirmed at the long-delayed forthcoming Church council. But the

Figure 17. Michelangelo. *Last Judgment*. Detail of lower right corner.



Council of Trent (1545-1563) disappointed their expectations and upheld instead the medieval dogmatics of St. Thomas Aquinas. Meanwhile, the Roman Inquisition, reconstituted in 1542, set about suppressing dissent and pronounced the views of Valdes and his disciples heretical. But the religious movement that culminated in Italy in the late 1530s remains a historic fact, and Michelangelo's Sistine fresco, its outstanding document.[72] No reason, therefore, to assume a priori that its eschatology—its implicit notions concerning grace, justification, the resurrection of the just, the materiality of hellfire and the eternity of its duration—would conform to the doctrinal formulations of the Council of Trent. We are less likely to fall into anachronism if we allow Michelangelo's fresco to reflect the freedom of those loyal Catholics who, before the Council and the revived Inquisition, speculated in pious faith upon the Last Things. I have in mind not only Valdes, who more or less cautiously questioned the reality of material Hell and the dogma of eternal damnation, but, closer to home, such a man as Cardinal Cajetan (1469-1534), General of the Dominican Order, pioneer in the revival of Thomism, and house theologian to both Medici popes. Yet even Cajetan's liberal opinions on the fires of Hell were declared *inconstans*—inconsistent, capricious.[73]

The chief agent of Michelangelo's spiritual conversion, at least after 1538, was Vittoria Colonna, whom Pope Paul III addressed as "*Dilecta in Christo filia*," and to whom the artist dedicated many of his most poignant spiritual poems. Her own revered confessor was the famous preacher Bernardino Ochino, Vicar-General of the Capuchins and chief spokesman for the theology of Valdes. To the dismay of Vittoria Colonna, Ochino apostatized in 1542 and fled to Geneva. She herself died in 1547, leaving Michelangelo stunned with grief. But ten years later, when the Inquisition was drawing up charges against Reginald Pole, it was held against the Cardinal of England that he had sheltered and encouraged a variety of heretics, including Vittoria Colonna.[74] Valdes's other outstanding disciple—Pietro Carnesecchi, former papal secretary and close friend of Vittoria Colonna—died in 1567 "in the Valdesian faith," beheaded and burned by the Inquisition. And Valdes himself, had he lived past 1541, could not have safely committed to paper a reflection such as the following from his *Hundred and Ten Considerations:* "Men, deceived by human philosophy and chiefly misled by superstition and false religion, represent God to us as so fastidious and irascible, that he is offended at everything; as so vindictive, that he punishes all offenses; as so cruel that he chastizes with eternal punishment." And in another place: "As the first Adam in submitting all men to misery and to death estranged all creatures, so the second Adam . . . leading all men to felicity and to eternal life will restore all creatures."[75]

This Evangelical creed is not far removed from that of some modern Catholic theologians anticipating a universe in which all men ultimately are saved by a loving God who is beyond comprehension. They fulfill an expectation voiced a quarter century ago in the closing paragraph of Eva-Maria Jung's fundamental paper "On the Nature of Evangelism in Sixteenth-Century Italy":

> Because of [the] undogmatic, artistocratic and provisional character of Evangelism, neither its contemporaries nor the historians of later centuries were able to distinguish the heretical tendencies from the orthodox forces in it, and to understand its true nature. Perhaps it was necessary to gain a perspective from which to look back over the development and experience of four hundred years, to recognize

> that the Counter-Reformation did not embrace all aspects of Catholicism, and that certain elements of Evangelism, once disregarded by the Counter-Reformation, were justified in themselves and are gaining ground again within the Roman Catholic Church, in the lay movement as well as in the liturgical and ecumenical movement.[76]

In the light of such a reflection we uncover a curious paradox: that we are less prone to anachronism if we interpret Michelangelo's work of the late 1530s in the spirit of Vatican II than in conformity with the Council of Trent. It is the *descriptions* we have of the fresco, those of Vasari and Condivi, that belong to the 1550s and '60s. They indeed assimilate the *Last Judgment* to Tridentine orthodoxy, so that Vasari can describe the face of the Christ as *orribile e fiera*, cursing the damned; whereas that face is grave and unsearchable; the action not one of angry rejection, but of arrested suspense. Hating sin—sin allegorized in the falling figures at right[77]—the Christ in the fresco gives no sign of hating the sinner. Nothing here justifies us in seeing Michelangelo's Christ as condemning vindictively to preside forever over retributive tortures, as the dogma affirms. To persist for yet another century in the pejorative reading of Michelangelo's vision, to declare with Pastor that the fresco were better entitled "The Condemnation of the Lost"; to call the *Last Judgment* "a purely punitive manifestation," in which the artist is "cursing mankind," in which the Christ "appears only as an avenging God" (Panofsky), "moved to denunciation alone" (Meiss), while surrounded by a lynching mob of righteous saints howling for vengeance—to rehearse these common tags is to ignore the spirit of Michelangelo's poetry, the evidence of his religious attachments, and the fresco itself.[78]

The faith confessed by the artist lies on the fresco's surface; it inheres in the message of gesture, in depicted events, in those "trains of thought" that we normally read as compositional vectors. To these crude physical data—no matter how trivial they may appear to minds more attuned to literary formulation—we now return.

Yes, the condemned are precipitated from Charon's barque; like mice from a sack, says one author, while Redig de Campos sees them as men without grace who have forfeited every vestige of their humanity to remain capable only of "bestial fear."[79] And yet, something amazing is happening in Charon's barque; not furtively amidst the crush, but large in the forefront, midway between the Minos figure and Charon. A profoundly anomalous incident: where every wretch should be gripped by his private panic, one sturdy youth, forgetful of self, tries to stay the headlong fall of a comrade who is being raked down by a fiend (Fig. 18).[80] His face, though distorted by strain, shows the strong bones which Michelangelo assigns to magnificent manhood And we recognize a conspicuous parallel between his attempt and that of the saving angel on the Resurrection side of the fresco (Fig. 11): in both groups a contested soul, topsy-turvy, is tugged at by the demons below and sustained above by a rescuer. But, of course, with the opposite outcome, for the effort of the valiant youth in the barque is futile gallantry.

But is it futile? He is acting on a protective impulse, an impulse of charity; and among the souls bound for the hopeless Hell of Catholic dogma, no such affect ought to arise. For, as Aquinas teaches, "after death the souls of the wick-

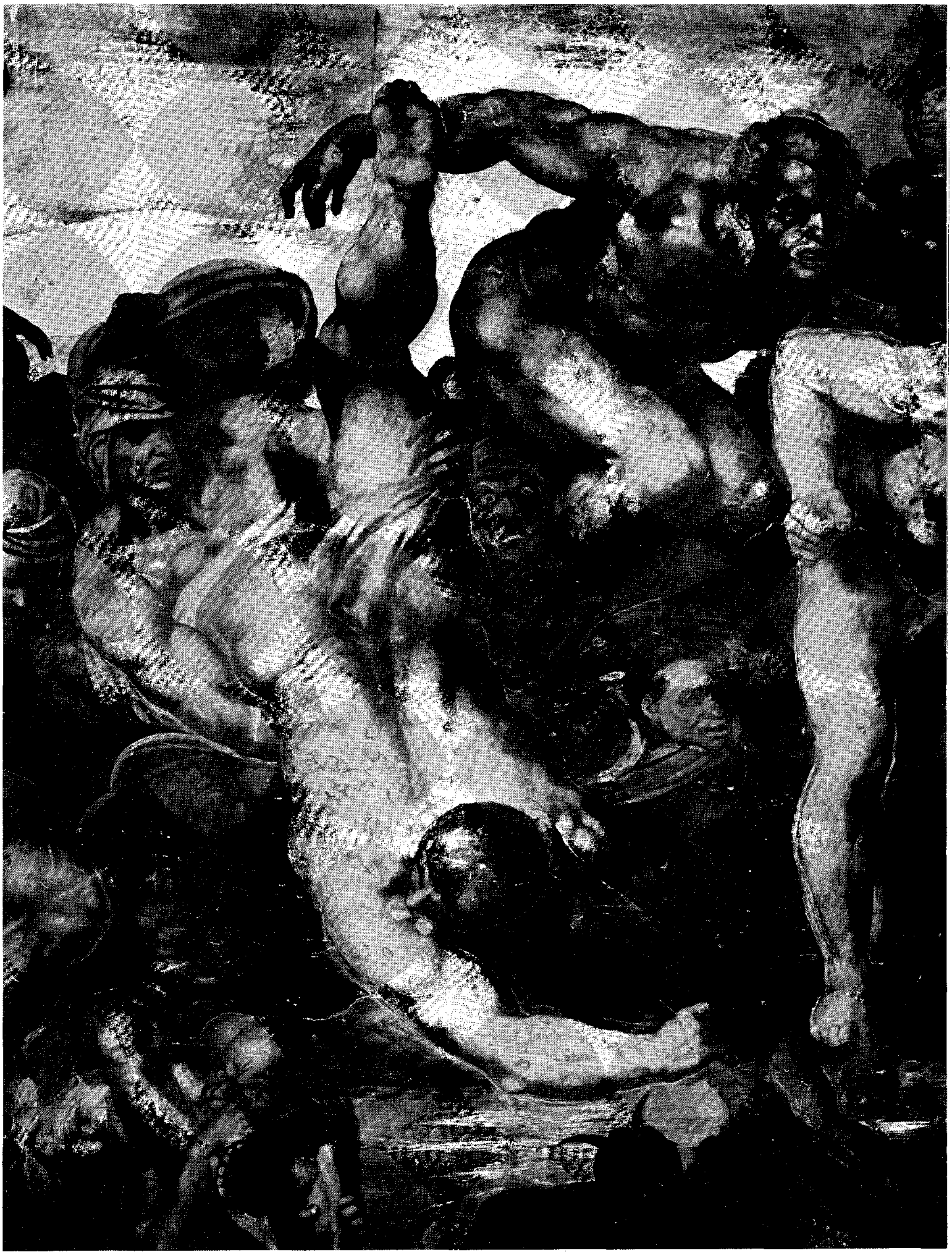


Figure 18. Michelangelo. *Last Judgment*. Detail from Charon's barque.

ed have a will unchangeable in evil." So, indeed, the doctrine had to be framed, since nothing less justifies the perpetuity of Hell's retribution.[81] And this teaching of the continuing evil will of the damned—expressed in their blasphemies and their reciprocal loathing—had sunk deep into the consciousness of the faithful. Even Dante, who individualizes the damned and allows some among them a residue of personality not wholly displeasing—even he acknowledges the Thomist doctrine when he hears Charon's passengers blaspheme against all mankind. In more conventional form, the message must have resounded from every Catholic pulpit at Lent. Thus we read in the *Speculum finalis retributionis* of Reginaldetus, a work intended for use by preachers, first printed in 1498 and thereafter in some twenty editions:

> You know how great a punishment is anger in man, so that in nothing whatever can consolation be found, neither in eating nor drinking nor even in something good to do. This will be a punishment of the damned . . . directed against the four following things: First, they will rage against divine power. Second, against perpetual misery. Third, against hostile demons. Fourth, against former friends. . . . and thus they are afflicted by one another in body and in soul, and more in soul than in body. But the question arises whether the damned will feel anger against those whom they have never seen, or who have never been to them an occasion for sinning. The answer must be so, that all the damned will harm one another reciprocally, and in the midst of fire. . . . And therefore they rage against one another and they curse one another.[82]

We are reminded of the Lenten sermon in the third chapter of Joyce's *Portrait of the Artist*—the passage that begins:

> The torment of this infernal prison is increased by the company of the damned themselves. . . . In hell all laws are overturned—there is no thought of family or country, of ties, of relationships. The damned howl and scream at one another, their torture and rage intensified by the presence of beings tortured and raging like themselves.[83]

Pure Aquinas: the souls of the dead who have died in sin are no longer free to will the good. And it is their fixed inclination to evil that makes those rejected by Christ perpetually re-deserving of their rejection. In the words of St. Catherine: "Guilt makes the will of the damned in Hell malignant, on whom God does not bestow his goodness and who remain therefore in desperate ill will."[84] Thus it is not permissible to allow them an impulse of altruism—such as Michelangelo imputes to the youth in the boat. If the artist was not being thoughtless, then that beau geste among the condemned signals for us the survival of moral nature and, with it, inevitably, the possibility of redemption.[85] And in that case, Hell becomes insecure, no longer an institution from which there is no reprieve. In short, the fraternal impulse of the heroic youth in the barque unsettles the moral ground of Hell's sempiternity.

And how do the hellites react? Of course, the underlings among them ply their business as if nothing had happened. But consider the action of Charon (Figs. 11, 19). According to Vasari (and Varchi), he conforms to Dante's infernal boatman who "smites with his oar whoever lingers." These words, along with the description of Charon's "eyes of burning coal," are quoted in Vasari's account of the fresco to demonstrate the agreement between image and text. But the correspondence is less than perfect. In the poem, the oar is brandished to

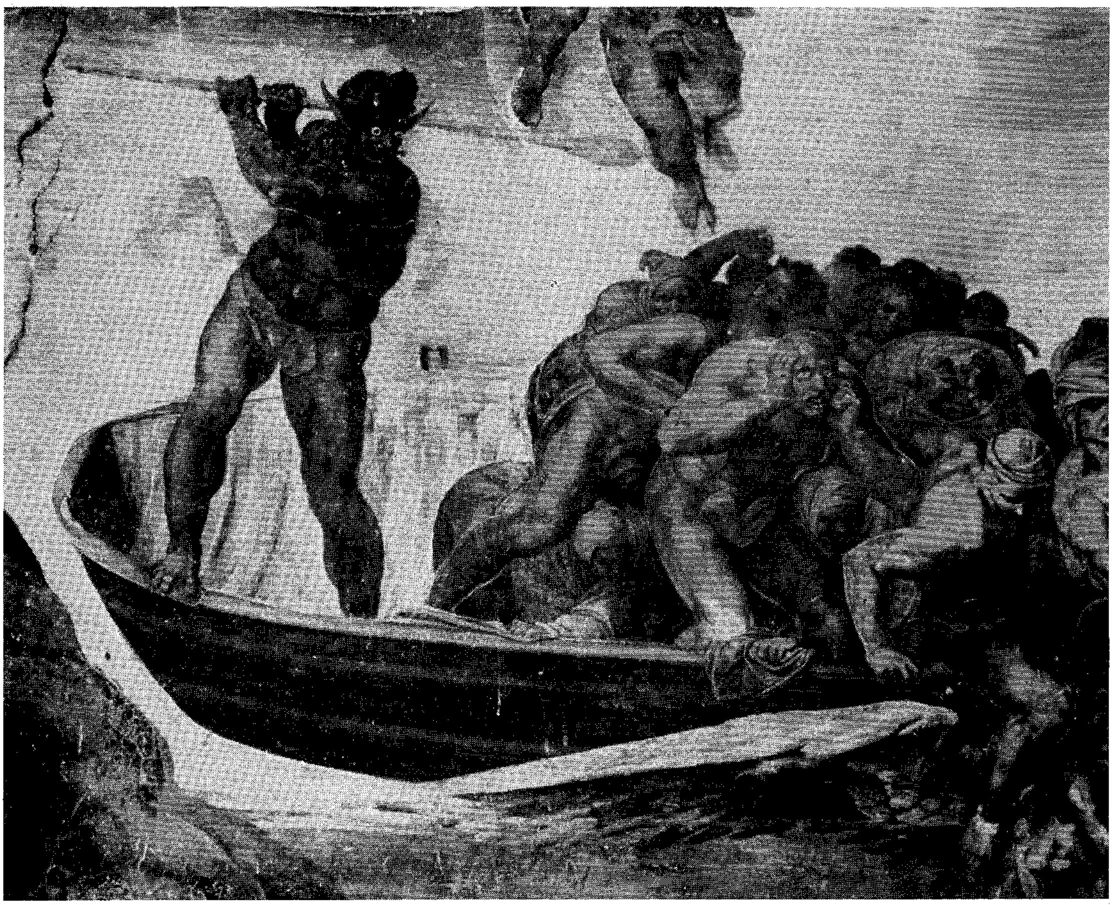


Figure 19. Michelangelo. *Last Judgment.* Detail of Charon.

hasten the process of embarkation, whereas it is the disembarkation on the opposite shore of Acheron that appears in the fresco. And is Charon here still smiting whoever lingers? Surely Michelangelo's Charon swings his oar injudiciously; were he to let fly, his passengers would recoil into the boat, which would frustrate his purpose.[86]

At this point, some of my readers perhaps feel put upon. Only a moment ago, someone sighs, we were meditating on the Last Things, and are we now into athletics? If Michelangelo cast his ferryman as a switch-hitter, he probably had formal reasons (unspecified) for reversing the action; Charon's misjudgment—a venial oversight on Michelangelo's part—demonstrates nothing but the artist's indifference to such trivia; a warning to would-be interpreters to quit interpreting before they go overboard; why invent problems where everything has always looked satisfactory? And so on. To my mind, such responses are mere evasions, insulting to an artist whose idiom is the body in action. Any Michelangelo gesture that belies its ostensible purpose deserves a close second look, the more so in view of Charon's striking efficiency. With one surefooted stride he has brought the weight of his right leg down on the gunnel, making the boat keel and discharge, like a tipped bucket voiding its load. This is good footwork, and one should assume no less skill in the swing of the oar. Suppose we assume an alternative target—such as the helping friend in the barque; such a target would necessitate the oar's actual aim. Could it be that Michelangelo's Charon is threatening the heroic youth to desist from an undertaking whose mere intent imperils the foundation of Hell? We can expect no certainty here. Some may feel that Charon stands too far off, or that the focus of his glance is unclear. Yet, since Charon must know what his passengers are about, the suggested scenario seems preferable to leaving these episodes unobserved and unmotivated.

Nor is Charon alone in noting the turn of events in the barque. He forms but the base of a vertical buildup of witnesses, all keenly alert and responsive after their fashion. It cannot be insignificant that the octet of angelic trumpeters over the central cave includes two who keep silent, the two facing the misery at lower right (Figs. 20, 21). While six blowhards puff away to awaken the dead, this pair are not sounding their brass. The younger looks to the keeper of the great book and seems impatient to start. The elder, his trumpet couched on his shoulder, calmly anticipates a long wait. Gazing down at the condemned—his head third in line with the heads of the two friends in the barque—he points his left hand (in imitation of Christ?) at the field of the Resurrection, and rests his clarion. Idling Doomsday away? Was any divinely charged noisemaker in any previous Last Judgment ever found so delinquent?[87] What can these angel buglers be waiting for? If they do not blow their instruments now—at the Last Trumpet—when else? Can it be that they wait to recall even the rejected ones after seasons or eons of expiation? From the viewpoint of post-Tridentine Catholicism, this again would be deviant thinking, since the dogma permits no recall of the damned.[88]

But the fresco is its own text, comparable to the Council itself in being "a religious fact of the highest order," as Tietze had put it. And in this text it is demonstrated *ad oculos* that Hell has been misunderstood; that Christ does not resurrect deceased sinners in order to freeze for eternity the evil will of their last living moments; that the impulse to *amicitia*—the pervasive force of the fresco, which binds the very angels together—survives wherever humanity is.[89] Even at this brink it survives and does not go undetected, for there are watchers at hand—Charon and the still clarioners, stacked at right angles to the sad barque, and the cornered one diverting the whole boatload from Hell. In the open arcana of Michelangelo's idiom, the fresco's watchers give notice that the punishment offered at lower right may not be the everlasting damnation of dogma, but—there being no other alternative—a remedial, purgatorial punishment, inflicted for the sinners' ultimate restoration. This is what I have called Michelangelo's "merciful heresy."

It would be foolish now to swing to the other extreme by declaring Michelangelo's conception of the Last Judgment to be royally optimistic. The artist himself, as his poems attest, felt unfit for salvation, yet hoped for remission. As a believer, he lived his late years in throes of uncertainty, between hope sprung from his knowledge of Christ and the consciousness of deserved rejection flowing continually from self-knowledge. And this dualism seems to me to have found expression again in the fresco. I refer to the contrast between the depicted

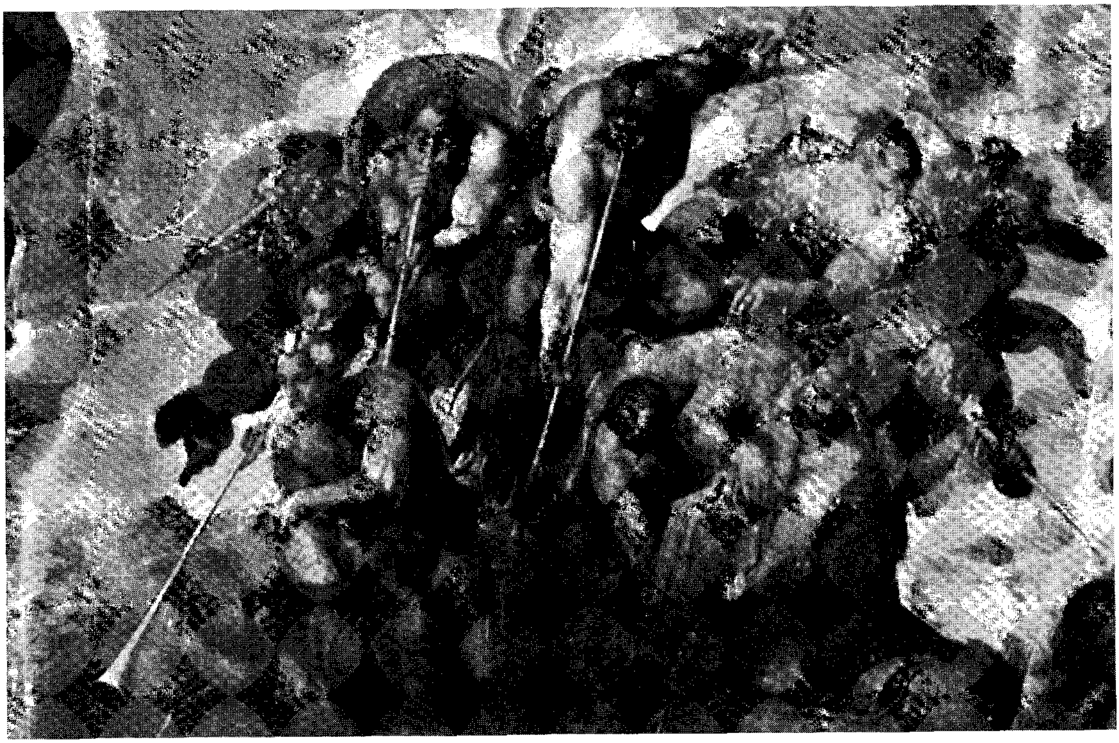
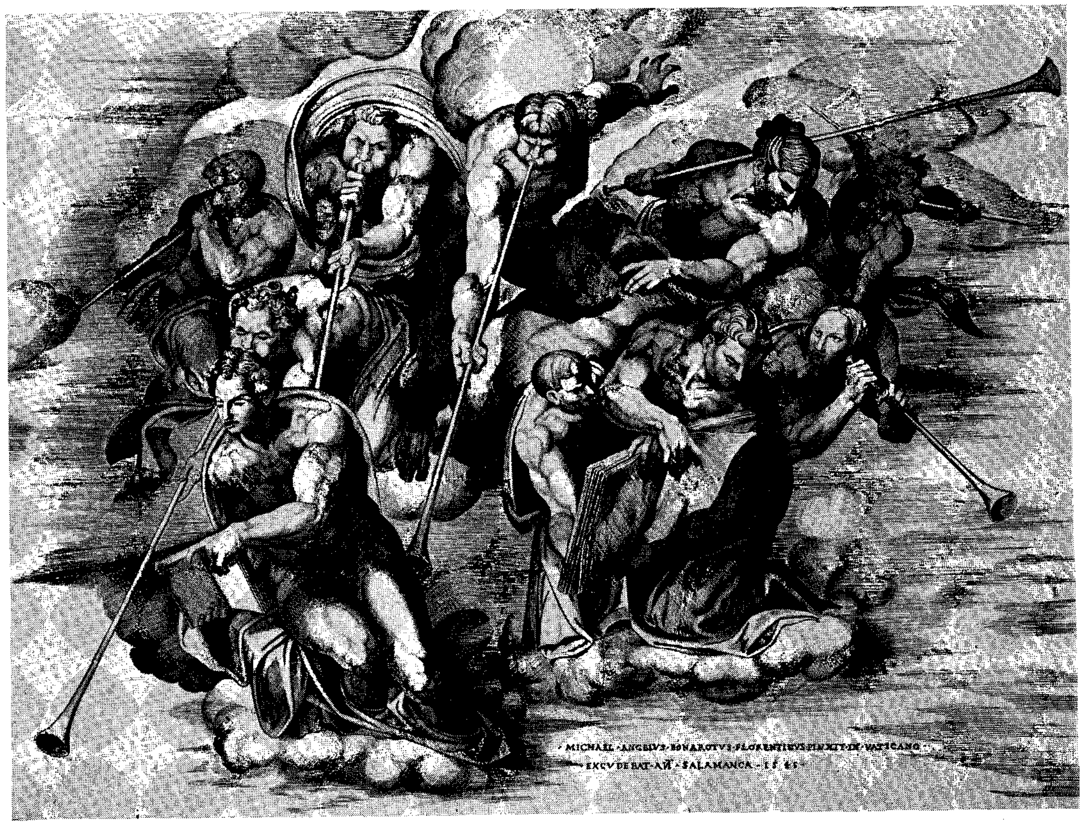


Figure 20. Michelangelo. *Last Judgment.* Detail of trumpeting angels.



· MICHAEL · ANGELVS · BONAROTVS · FLORENTINVS PINXIT · IN · VATICANO ·
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Figure 21. Antonio Salamanca (publisher) after Michelangelo. Trumpeting angels from *Last Judgmen*
engraving, 1545.

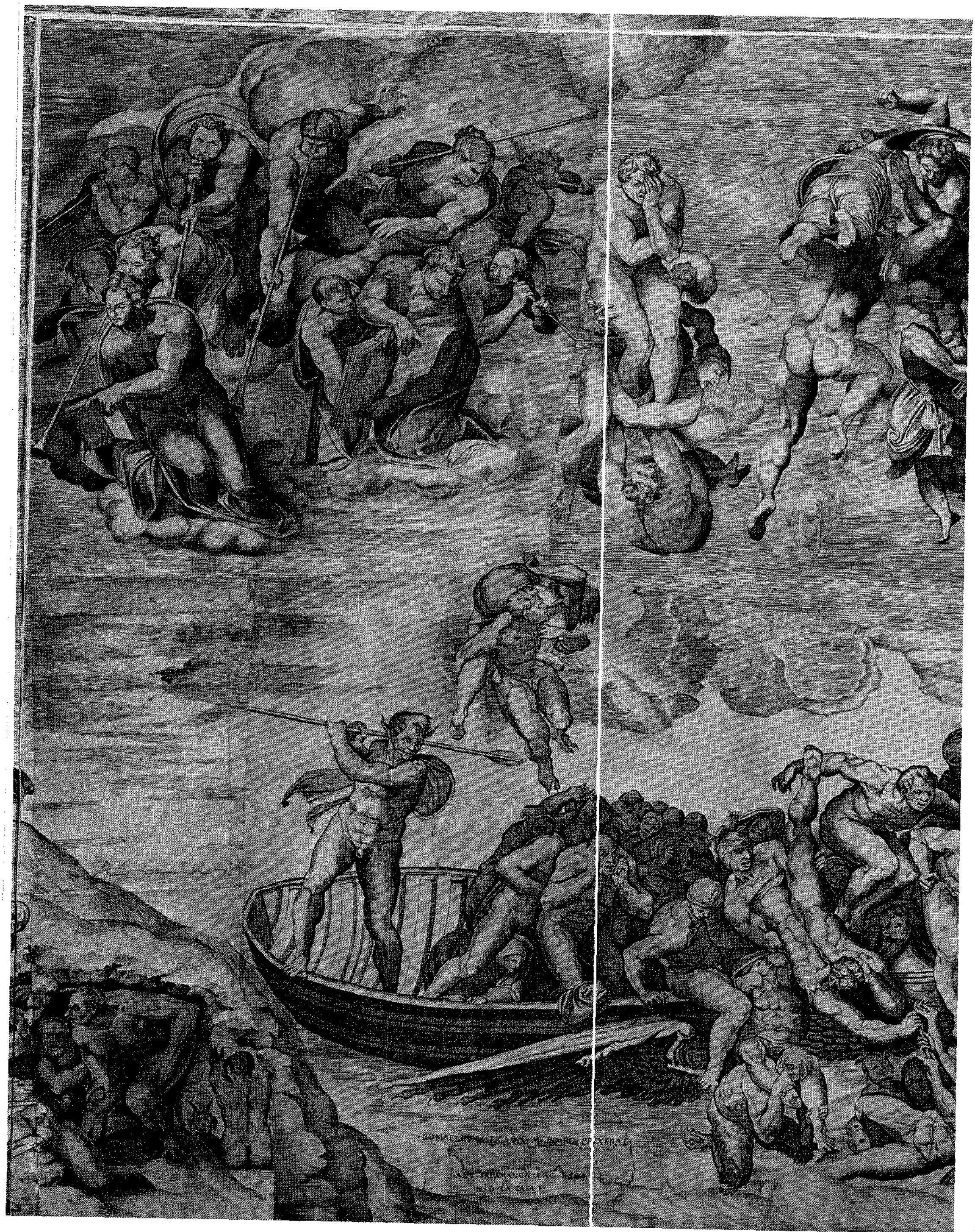

Figure 22. Niccolò Della Casa after Michelangelo. *Last Judgment*, engraving, 1543. Detail of lower zone.

experience of the condemned and the response it elicits. There is a disparity between their astricted ken and the large context revealed (Fig. 22). For them, no consoling reprieve is in sight. Their portion, their immediate inheritance, is the self-awareness gained by the sinner at the Last Judgment; and Michelangelo represents it as tormenting and real. He introduces the theme following hard on his self-image in that ghastly icon of guilt—shameface stung by remorse (biting serpent), sunk down by his sins. Above the many-voiced choruses of the fresco this pivotal figure drones out the theme of belated self-knowledge, which reverberates in the barque directly below. For the rest, Charon's passengers undergo varied emotions—from horror to resignation, from howling despair or shame to calm acquiescence, and from full self-absorption to fraternal aid. The one thought shared by all is that they believe themselves to be verging on Hell, and on a Hell self-inflicted. Self-knowledge attained—its symbol is the elephant folio upheld overhead[90]—they see only their earned, imminent exile. For the painter has so contrived it that their visual field includes neither the averted hellmouth, nor the corner keeper's directing index, nor the dismay of senior demons whose fief is in jeopardy, nor, among the angels, the alerted goodwill.

And one other gift lies even further beyond their sight: the long throw of a diagonal that descends upon them from the Madonna's bare foot (Pl. VI). Are we hallucinating? Is not the Virgin's foot leagues away, demurely retracted, and preempted to influence the better half of the fresco? And yet, that bare foot is touched by the instrument of a passion, to wit, St. Lawrence's grille, the gridiron on which he was roasted. And it is improbable that Michelangelo would let any metal accost the flesh of the Virgin without taking notice. But what of the gridiron itself? In thousands of images of St. Lawrence, its form had been set: not less than three mullions to brace the crossbars, and at the corners four pegs by which the grid is raised above ground to allow for kindling beneath. Yet Michelangelo's martyr sports a uniquely unfunctional instrument, a gridiron only by virtue of context, but in appearance for all the world like a ladder.[91] And this grille-become-ladder, this visual paronomasia, receives the ball of the Virgin's foot. Is this a fluke, or is it a thought that relays the pledge of the Madonna della Scala down to the nether regions? For there is one rectilinear concatenation from her foot, by way of the ladder direct to the head of the pausing trumpeter who points to the Resurrection, and so to the heads of the unseeing friends in the barque: a minor lifeline, or emission of grace, to parallel the major diagonal in which Christ himself is engaged (Fig. 23). I ask again, are we hallucinating? Shall we call the alignments along this chute accidental—felicitous by-products of composition? Or are we once again beholding a train of thought, an influence of compassion proceeding to the condemned? When Erasmus writes, "Not only the earth is full of the Lord's mercy, but also heaven and hell"—we may not know his meaning exactly, but that such an utterance was in fact made, at least that much we know. Michelangelo's idiom denies us this modest certainty. What it offers instead, to those who keep looking, is the privilege to remain lost in wonder.

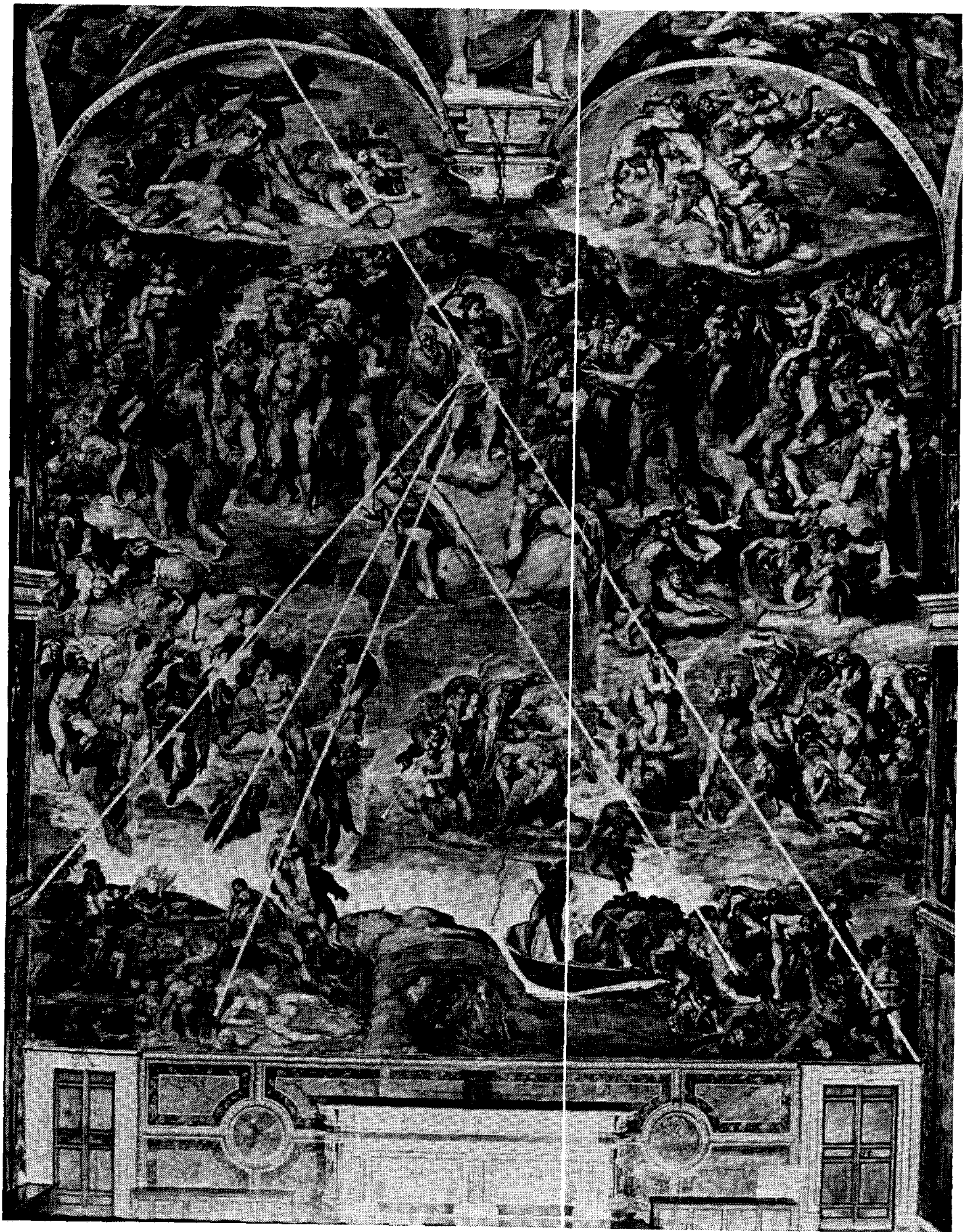

Figure 23. *Last Judgment* with diagonal overlays.

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[1] As quoted in Roland Penrose, *Picasso: His Life and Work* (New York: 1959), p. 374.

[2] For full bibliographical references to Michelangelo's two contemporary biographers, Giorgio Vasari and Ascanio Condivi, see References 7 and 49.

[3] Hans Tietze, "Michelangelos Jüngstes Gericht und die Nachwelt," *Festschrift . . . Paul Clemen* (Düsseldorf-Bonn: 1926), p. 433: "Es fügt sich nicht der Unterscheidung von Reformation oder Gegenreformation ein, bildet aber einer Teil der grossen Bewegung, die die laue und rationalistische Einstellung des vorangegangenen Jahrhunderts überwindend mit der Religion wieder Ernst macht. . . . Das 'Jüngste Gericht' ist eben nicht nur ein Zeugnis dieser religiösen Strömungen, sondern ist selbst eine religiöse Tatsache höchsten Ranges, so gut wie die Musik Palästrinas oder das Konzil von Trient."

[4] Philostratus, *Imagines,* Arthur Fairbanks (ed.) (London-New York: 1931), p. 7.

[5] Hence Henry Thode: "Die Siebenzahl der Posaunenblasenden Engel—statt der Vierzahl in den älteren Darstellungen—entnahm der Künstler, wie schon Vasari und Condivi bemerkten, der Apokalypse (8, 2)" (*Michelangelo, Kritische Untersuchungen,* II [Berlin: 1908], p. 39). Feldhusen follows: "Die sieben Posaunenengel gehen auf den Apokalypse-Text selbst zurück . . . (Ruth Feldhusen, *Ikonologische Studien zu Michelangelos Jüngstem Gericht,* Diss. [Hamburg: 1953; reprint 1978], p. 63). Michelangelo's trumpeters are still "the angels of the Apocalypse" for von Einem (Herbert von Einem, *Michelangelo* [London: 1973], p. 149); and for Ashton L. Townsley: "The seven Revelation angels sound their *tuba mirum,* signalling the dead to rise" ("Michelangelo's *Last Judgment* and its Aesthetic Implications," *Franciscan Studies,* 32 [1972]: 220). Cf. also p. 245, above.

[6] Charles Dickens, *Bleak House,* ch. 2.

[7] *Giorgio Vasari: La Vita di Michelangelo nelle redazioni del 1550 e del 1568,* Paola Barocchi (ed.) (Milan-Naples: 1962), III, pp. 1297-1301; henceforth cited as Barocchi-Vasari.

[8] The first overpainting of the nudities in the *Last Judgment* was ordered on January 21, 1564, by the *Congregatio Concilii Tridentini,* set up in the preceding month at the final session of the Council of Trent. The *Congregatio* decided "Picturae in capella Apostolica coperiantur . . ."—a saving compromise designed to appease the more strident objectors who wanted the whole fresco obliterated. For the overpainting, begun by Daniele da Volterra in 1565 and aggravated in successive campaigns (1565-1569, 1586, and 1762), see Charles de Tolnay, *Michelangelo: The Final Period* (Princeton: 1960), p. 98; henceforth cited as Tolnay, V. The matter is discussed in fullest detail in E. Camesasca et al., *The Sistine Chapel* (New York: n.d.), I, pp. 248-50. Unfortunately, no surviving records tell how those hired "breeches painters" felt about their assignments. But in several places their fluttering loincloths must have been flown in jest, e.g., on the rump of the sinking demon against the lower right margin. Michelangelo had given him a fat tail, which effectively hid his peachcleft; the blue fabric that now takes its place leaves the tip of the erstwhile tail adrift without mooring. Who will believe that this pleasantry proceeded (as a distinguished colleague assures me) from excess of zeal, rather than irony?

[9] Carlo Grigioni, "Le nudità del 'Giudizio Universale,' " *Il Trebbo* (Mensile della Romagna, Forlì), 2 (1942): 77. This rare publication was hunted down for me by Mr. Jack Freiberg, to whom I extend my warm thanks.

[10] In Stephan Lochner's *Last Judgment* in the Wallraf-Richartz Museum, Cologne, all the blessed are thin; most of the damned surging hellward are overweight.

[11] A modern viewer, programmed by art education, though he may agree in finding Michelangelo's St. Catherine somewhat stout, will probably suppress such an observation as inappropriate. Familiarity with the Flemish Baroque may have inured him to corpulence in high art. He is more likely to notice how deftly St. Catherine leans into her martyr's wheel, as if inscribed in its ambit; surely an admirable invention, and one that could not have been brought off with a figure of slender build. But the artist's contemporaries saw only that this best-fed of martyrs was, as it were, letting everything hang out while ostensibly hoisting the instrument of her passion, allowing no alternative between glee and stern disapproval.

[12] "E per meglio far le persone ridere, l'ha fatta chinare dinanzi a san Biagio con atto poco onesto; il quale, standoli sopra coi pettini, par che gli minacci che stia fissa, et ella si rivolta a lui in guisa che dica: 'Che farai?' o simil cosa"; Gilio da Fabriano, *Degli Errori de'Pittori* (1564), Paola Barocchi (ed.), *Trattati d'Arte del Cinquecento,* II (Bari: 1961), p. 81. The speech here imputed to the fresco's St. Catherine anticipates the salacious captions used to enliven Old Master paintings in sleazy books popular some years ago.

[13] The offense intensified in proportion to the growth of civility. By the 1660s, the Frenchman Roland Fréart de Chambray complained: "il depeint mesme les Anges sous des apparences d'hommes si grossiers et si materiels . . . qu'on ne les peut regarder sans aversion" (*Idée de la Perfection de la Peinture* [Le Mans: 1662], p. 75). Two centuries later Herman Grimm wrote in *Leben Michelangelos* (1860; ed. Vienna: n.d.), p. 544: "keine Spur des zart Ätherischen findet sich hier, dass unserem Gefühl nach der Hülle eines abgeschiedenen Geistes nicht fehlen dürfte, wenn durchaus denn einmal eine solche Hülle dargestellt werden soll. Dem deutschen Geiste widerstrebt es, das in fester, bildlicher Gestaltung zu erblicken, was sich in Gedanken nicht einmal erreichen lässt."

[14] Reasons for interpreting the tumbling figures at right as personifications of the Seven Deadly Sins rather than as individual sinners are given in L. Steinberg, "Michelangelo's *Last Judgment* as Merciful Heresy," *Art in America* (November-December 1975): 5[illegible]; henceforth cited as "Merciful Heresy."

[15] Barocchi-Vasari, I. p. 74f.

[16] Lodovico Domenichi, *Detti, et fatti di diversi signori et persone private, i quali communemente si chiamano facetie, motti, e burle* (Florence: 1562), p. 242. See E. Steinmann and R. Wittkower, *Michelangelo Bibliographie* (Leipzig: 1927), no. 568, for later editions of Domenichi's work.

[17] Several of Biagio's diaries were published in J. B. Gatticus, *Acta selecta caeremonialia sanctae romanae ecclesiae* (Rome: 1753). Manuscripts are preserved in the Biblioteca Nazionale, Rome (Fondo Gesuitico 270), in the Archivio Segreto Vaticano (Fondo Borghesiano, serie IV^{a}, n. 64; and Cod. vat. 7167 q 981) and in the British Museum (Add. Ms. 8446).

[18] Carlo Grigioni, a fellow Romagnole, announced in his 1942 article (Ref. n. 9) that he was preparing a life of Biagio based on many years of research in the Vatican archives. But the author was himself nearing seventy at the time of the announcement, and the work does not seem to have been completed.

[19] The sensible substitution of Purgatory for Hell in reporting the Pope's witticism seems to go back to the Richardsons (1728): "si le Peintre l'avoit mis dans le Purgatoire, il auroit emploïé tout son crédit pour l'en retirer; mais que, comme il étoit en Enfer, il n'y avoit pas moïen de l'en faire sortir" (*Description de Plusieurs Statues, Tableaux, Dessins & c. qui se trouvent en Italie* [Amsterdam: 1728], p. 495). Similarly, G. Bottari in 1760 (Ref. 22) and Milanesi who, in retelling the anecdote, has the pope tell Biagio: "Se il pittore t'avesse collocato nel Purgatorio, avrei fatto ogni sforzo per giovarti; ma poichè ti ha posto nell'Inferno, è inutile che tu ricorra a me, perchè ivi *nulla est redemptio*" (*Le Vite de'più eccellenti pittori, scultori, ed archittetori scritte da Giorgio Vasari*, Gaetano Milanesi [ed.] [Florence: 1906], p. 211, n.2).

[20] The date suggested falls after December 15, 1540, when a payment records the lowering of the scaffolding. See E. Steinmann, *Die Sixtinische Kapelle* (Munich: 1905), II, p. 511, and Tolnay, V, p. 21. Redig de Campos (D. Redig de Campos and B. Biagetti, *Il Giudizio Universale di Michelangelo* [Milan: 1964], p. 27) would date the incident somewhat earlier, taking note of Biagio's grave illness, recorded in his diary for September, 1540; to which we may add that Biagio had retired during that year. But there is no reason to assume that the Pope and his *ceremoniere* could not have climbed the scaffolding some months before to inspect the last-finished parts of the fresco. Even nine years later, at age eighty-two, Pope Paul III is recorded as viewing Michelangelo's *Crucifixion of Peter* in the Cappella Paolina while the scaffolding was still up: "His Holiness is so hardy that this morning he climbed a ladder of ten or twelve rungs to see the paintings which Buonarroti made in the chapel" (F. Baumgart and B. Biagetti, *Gli affreschi di Michelangelo . . . nella Cappella Paolina* [Vatican City: 1935], p. 77).

[21] Barocchi-Vasari, III, p. 1297, quoting from Aretino's letter to Michelangelo, 1545: "In un bagno delizioso, non in un coro supremo, si conveniva il far vostro."

[22] Vasari's apparent misobservation regarding the serpent is rebuked by G. Bottari (*Vite de'più eccellenti pittori . . . scritte da Giorgio Vasari* [Rome: 1760], III, p. 254, n. 1): "Minosse è espresso con una gran coda, che gli cigne più volte il petto, e non le gambe, come per isbaglio dice il Vasari; e il Buonarroti il fece così, seguendo la finzione di Dante." The above "correction" is transcribed almost verbatim in Milanesi-Vasari, VII, p. 211, n. 2. Unfortunately, in correcting Vasari, neither Bottari nor Milanesi noticed that they were perpetuating a greater error, mistaking Minos's serpent for a demonic tail, about which more will be said below, Ref. n. 44.

[23] See the charts of the fresco outlining each *giornata* (day's work) in Redig de Campos-Biagetti, *Il Giudizio Universale*, Pl. LXIV and our Fig. 24, from Camesasca, *The Sistine Chapel*, Fig. 225. The issue may be clarified by analogizing the charts to the map of a federated republic, say, the United States. Suppose the fresco painter, working from the top down in horizontal bands, had just finished the zone running from northern California to Virginia. He could not paint a portion of Georgia (in the fresco, the head of Minos) before the Carolinas had been laid down.

[24] Wolfgang Kallab remarked in a footnote ("Die Deutung von Michelangelos Jüngstem Gerichte," in *Beiträge zur Kunstgeschichte Franz Wickhoff gewidmet* . . [Vienna: 1903], p. 143, n. 1): "Dass der Vorfall, so wie er hier [i.e., in Vasari's account] erzählt wird, der Wahrheit nicht entspricht, erhellt ausser aus Condivis Schweigen aus dem Umstande, dass der Kopf des Minos kein Porträt ist" (though it is precisely the "indubitable" portrait character of the head which, for other scholars, confirms the truth of the story). Kallab was followed by Thode, still the most intelligent of Michelangelo commentators: "Ob Minos die Porträtzüge des Zeremonienmeisters Biagio trägt, scheint mir, wie Kallab, sehr zweifelhaft" (*Kritische Untersuchungen*, p. 64). Cf. Léon Dorez on Biagio, "que Michel-Ange aurait ignominieusement introduit dans la fresque, et il [Steinmann] incline à en admettre l'authenticité. Je crois que Vasari et Domenichi se sont plu tous deux à rapporter une anecdote plus ou moins spirituelle, très goûtée de leurs temps, sans trop se soucier si elle était vraie ou fausse. Elle est bien invraisemblable" (*La cour du Pape Paul III d'après les registres de la Trésorerie secrètes* [Paris: 1932], I, p. 152, n. 2). Richard Hoffman (*Michelangelo: Das Jüngste Gericht*

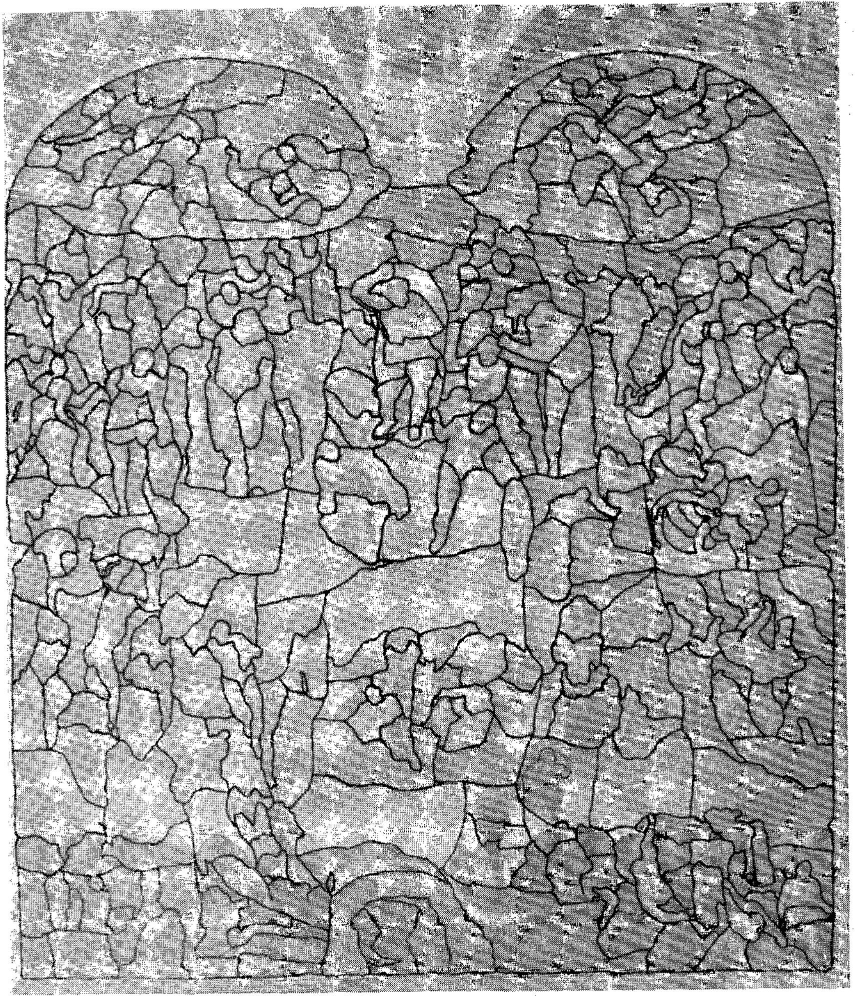

Figure 24. Chart of days' works on *Last Judgment*.

[Augsburg: 1929], p. 29), though he cannot bring himself to challenge Vasari, doubts the portrait character of Minos's head because "such degeneracy is surely not to be found on a human face" ("eine derartige Verworfenheit wird doch wohl kaum auf einem menschlichen Antlitze zu finden sein").

[25]Steinmann, *Die Sixtinische Kapelle*, p. 511, n. 4, after citing the anecdote in both Vasari's and Domenichi's versions: "Diesen beiden voneinander unabhängigen Quellen gegenüber ist es unzulässig, die Begebenheit anzuzweifeln, wie es Kallab gethan hat." Similarly, Redig de Campos, listing the head of Michelangelo's Minos as one of the three authentic portraits executed by the master (along with the self-portrait in the flayed skin in the *Last Judgment* and a lost drawing of Tommaso Cavalieri cited by Vasari): "L'autenticità dell'episodio, da alcuni messa in dubbio, è pero suffragata da ben tre testimonianze contemporanee e indipendenti: il testo del Vasari nelle due edizioni; una pasquinata anonima conservata in un ms. della Biblioteca Vaticana, e il libro delle *Facezie* di L. Domenichi" (*Il Giudizio Universale*, p. 27, n. 4). For the author's error concerning the "pasquinata anonima," see p. 220. The error recurs in Barocchi-Vasari, III, p. 1300: "L'esistenza di testimonianze contemporanee (il Domenichi e il sonnetto di Pasquino) sembra convalidare la notizia vasariana." Even Ernst Gombrich regards the incident as a "private joke," whose "cause and meaning are clear." Reviewing a book of mine, and deploring some of my speculations as "a dangerous

model to follow," he retold the Biagio-Minos story as a contrasting paradigm of solid fact based on a primary source ("Talking of Michelangelo," *The New York Review of Books*, January 20, 1977, p. 19).

[26] Ettore Cozzani: "Tra questi [timorati e inetti] il più pericoloso era il Maestro di cerimonie del papa Paolo III, Biagio da Cesena, il quale di continuo mormorava al Pontefice ch'egli si sarebbe disonorato se avesse lasciata compiere una simile profanazione della Sistina" ("Il quarto centenario del Giudizio Universale," *L'Eroica*, 31 [March-May 1941]). The "odious moralist" appellation occurs in Grigioni, "Le nudità del 'Giudizio Universale'," p. 74. At his best, Biagio is a "kleinliche Kreatur" (Richard Hoffmann, *Das Jüngste Gericht*, p. 9).

[27] "Et post easquaedam mulieres saecularis similiter osculatae sunt contra voluntatem meam (esclama il zelante Martinelli! Egli è il punito da Michelangelo . . .), et me reclamante tamen inaudito, quia ultra solitum, et honestatem" (G. Moroni, *Dizionario di Erudizione ecclesiatica*, XCVII, pp. 168-9).

[28] Better a bad press than the second death of oblivion. Carlo Grigioni ("Le nudità del 'Giudizio Universale,' " p. 77) points out that "Biagio should be grateful to Michelangelo because, had the affair of the nudes not occurred, no one would now remember him, whereas there exists today no Roman guidebook, no cicerone, that fails to invoke his name. Michelangelo, Minos and Biagio da Cesena compose forevermore *un trinomio indissolubile.*"

[29] A word on those asses' ears may be of interest to students of comparative anatomy. The description is inexact. They are not asses' ears, but an imaginative transformation of human ears: lobe, lower helix, and tragus are normal; the rest grows monstrous by elongation, a devolution wonderfully appropriate to fallen angels. As standard demonic equipment, the same feature adorns several of Minos's fellows.

[30] Cf. Henry Peacham's *The Compleat Gentleman* (1622): "For Epigrams, *Pasquine* will affoord you the best and quickest I know. You shall have them bound in two volumes."

[31] Ludwig Pastor, *The History of the Popes from the Close of the Middle Ages*, 3rd ed. (London-St. Louis: 1950), XII, p. 616, n. 4.

[32] Redig de Campos, *Il Giudizio Universale*, p. 28, n. 5: "Una copia contemporanea di questo sonnetto (inedito, ma troppo libero per essere qui trascritto) si trova nel cod. Ottob. lat. 2811, a fol. 75^{r}. . . . La figura di Minosse vi è esplicitamente chiamata 'Cesena,' e vi si legge che costui 'sta con li muorti per suo mal governo / tutto ascosto in un certo cantonazzo ' " Barocchi-Vasari, III, p. 1297, repeats: "un sonnetto di Pasquino in cui Minosse è chiamato 'Cesena.' " Most recently, Romeo De Maio cited this "ferocious pasquinade" as proof of the indubitable authenticity of Vasari's anecdote (*Michelangelo e la Controriforma* [Rome-Bari: 1978], p. 18 and p. 47, n. 5).

[33] Kallab, "Die Deutung von Michelangelos Jüngstem Gericht," p. 143, n. 1.

[34] The documentary importance of Nicolò Della Casa's engraving of the *Last Judgment*—a composite image intended to be assembled from 11 (or 12?) separate plates—has not been sufficiently recognized in the Michelangelo literature, where Marcello Venusti's painted copy in Naples is continually cited as the first copy extant. (Thus, Feldhusen, Tolnay, von Einem, and others). The Della Casa engraving was first issued in 1543, evidently in a small edition, since impressions bearing that early date, such as the one in the Albertina, seem exceedingly rare. In the second edition the last digit was altered to make the date read 1548. For further discussion of the engraving, see Ref. n. 57.

[35] So extraneous did the baldhead appear to the engraver Leonard Gaultier (Le Blanc II, 18, copying the print by M. Rota) that he winged it with animal ears to assimilate it to the brood of devils.

[36] Vasari actually stresses the lack of vengefulness in Michelangelo's temper: "È stato sdegnoso, e giustamente, verso di chi gli ha fatto ingiuria; non però s'è visto mai esser corso alla vendetta" (Barocchi-Vasari, I, p. 124).

[37] A characteristic complaint occurs in a letter written in 1561 by Scipione Saurolo to St. Charles Borromeo: "Whoever looked upon a painting of that dread Last Judgment in which the barque of Acheron was depicted?" (quoted in Pastor, *The History of the Popes*, XII, p. 617). A hundred years later the legitimacy of such mythologizing is still argued around Charon alone, with no mention of Minos. Thus Félibien: "Il y en a un qui conduit une barque, & qui ressemble, dites vous, un Charon des payens: si c'est une faute, il ne l'a commisse qu'après le Dante. . . . Michelangelo n'a pas cru faire un crime en imitant un poète qui n'avoit point été condamné pour s'être servi de ces sortes d'expressions" (*Entretiens sur les vies et sur les ouvrages des plus excellens peintres anciens et modernes* [Paris: 1666], II, pp. 275-6). Not until 1740 did Minos get equal billing in a complaint lodged by Johann Georg Keyssler: "Es ist auch nicht zu entschuldigen, dass bey einer so wichtigen Materie des Christenthums aus den heidnischen Fabeln Charon und Minos mit auf dem Platze und gleichsam in ihren Aemtern erscheinen" (*Neueste Reisen* [1740], 2nd ed. [Hannover: 1751], p. 576). From this point on Minos and Charon become inseparable. Milizia regrets "la mescolanza del sacro col profano, del cristiano col favoloso. Difetto del secolo, e comune a tutti i Poeti, ed Oratori d'allora, non che ai Pittori. E tutto il favoloso si riduce a Minos ed a Caronte. Idee, che Michelangelo prese da Dante, di cui egli fu studiosissimo" (*Le vite de'più celebri architetti* [Rome: 1768], p. 229). It was left to the Romantics to undertake the master's defense in earnest. Thus Ludwig Tieck: "Der alte Fährmann Charon ist unter ihnen, und treibt manche in seinen Kahn, der gräuliche Minos vollzieht das Urteil.

Man werfe nicht ein, dass hier Mythologie der Griechen mit christlicher Lehre vermischt sey, denn diese Bilder sind ächt katholisch" (*Das jüngste Gericht von Michael Angelo*, in W. H. Wackenroder, *Phantasien über die Kunst* [Hamburg: 1799], p. 75). Delacroix's brief for Michelangelo speaks similarly of "*ce mélange païen de Minos, de Caron*, etc." (His essay on Michelangelo first appeared in the *Revue de Paris* of 1830; reprinted in Delacroix, *Oeuvres Littéraires*, 3rd ed. [Paris: 1923], II, p. 49.) Even Arturo Farinelli, whose important work of 1918 swept away the alleged Dantisms in Michelangelo's fresco, allowed only two Dantesque features to stand: the persons of Charon and Minos (*Michelangelo e Dante* [Turin: 1918]; cf. the review by Panofsky, "Die Michelangelo-Literatur seit 1914," *Wiener Jahrbuch für Kunstgeschichte*, 15 [1921-1922]: 60).

[38] See Benedetto Varchi, *Due Lezzione nella quale si disputa della maggioranza delle arti* . . . (1549), Barocchi (ed.), *Trattati d'Arte*, I, p. 57: "Chi non si ricorda, quando vede Minosse, di quell'altro nel V canto dell'Inferno?" Since the manuscript of Vasari's Michelangelo *Vita* was completed by 1547, though not published until 1550, we cannot be sure which of the two authors, Vasari or Varchi, first proposed the identification of Michelangelo's corner figure with "Minos." Barocchi, Ibid., p. 374, n. 9, points out that "Il rinvio dantesco, proposto dal Varchi, non ha captato l'interesse dei contemporanei, preoccupati di narrare a proposito di Minosse, l'aneddoto di Biagio da Cesena."

[39] *Le Rappresentazioni di Feo Belcari* (Florence: 1833), pp. 124, 151.

[40] John Ciardi translation. Dante's neutral expression "Stavvi Minos" is invariably interpreted as a "sitting" in judgment by illustrators as well as translators.

[41] The determination to identify the corner figure with its supposed Dantean model has landed even prestigious scholars in hilarious confusion. Paul Schubring in his monograph *Die Sixtinische Kapelle* (Rome: 1909), p. 43, recognizes that the figure is not ringed by a tail but by a serpent. He proceeds, accordingly, to rewrite Dante, whose Minos, he declares, delivers his verdict by sending snakes to wind themselves about the condemned soul—one coil for each degree it must descend. Michelangelo's corner figure then becomes a "Verbrecher von der Schlange doppelt umgürtet." Schubring does not notice that this snake-girdled "criminal" sports the earmarks of a demon and, more astonishing, that his reading has caused Minos to disappear from the scene altogether.

[42] The figure reproduced here is taken from A. M. Hind, *Early Italian Engraving* (London: 1938-1948), A. I. 60. For two related engravings, see Hind, A. I. 59 and B. III. 7, the latter based on Fra Angelico's *Last Judgment*, Museo di San Marco, Florence. For the destroyed Camposanto fresco, see also Piero Sampaolesi, *Camposanto Monumentale di Pisa* (Pisa: 1960), especially the nineteenth century engraving on p. 52.

[43] It is worth reflecting that our notions of social propriety are themselves a legacy of the Counter-Reformation. The *Galateo*, or *Book of Manners* (Venice: 1558), which more than any other single handbook established our rules of decency and etiquette, was written by the same Giovanni Della Casa who also conceived and authorized the *Index Librorum Prohibitorum*.

[44] After the Pasquino sonnet of 1541, the mordant serpent fades from the literature until A. Taja, *Descrizione del Palazzo Apostolico Vaticano* (Rome: 1750), p. 61f. To the standard recital of the Biagio story, Taja appends this description: "Minos, tutto nudo, come or si vede, se non che l'attorcigliamento e la testa d'una gran serpe gli ricuopre appena quelle parti onde l'umana onestà si prende vergogna." A generation later the Abbé Hauchecorne writes, again in the context of the Biagio anecdote: "Michel-Ange, au lieu d'en faire un juge comme le décrit le Dante, en a fait un malheureux mordu cruellement par le serpent dans la partie de sons corps la plus sensible." And he adds sagely: "Aussi est-ce improprement dit un Minos?" (*Vie de Michel-Ange* [Paris: 1783], p. 185).

But the most elaborate fancy is due to Stendhal. The great novelist swallows the vulgar notion that St. Blaise, high up in the fresco, had been shown sodomizing St. Catherine; and inspired by the homonymy of St. Blaise (S. Biagio) and the papal Master of Ceremonies, he speculates that our corner figure, portraying the latter, was being punished for a criminal sexuality, enacted, to make the point, by his sainted namesake above. Of the St. Blaise he had written: "C'est ici que se trouve cette étrange distraction de M.-A." He then proceeds to the Minos-Biagio: "Sa figure a toute la bassesse que peut admettre l'horreur du sujet; le serpent qui fait deux fois le tour de sons corps le mord cruellement et indique le chemin qui l'a conduit en enfer." An accompanying note does the rest: "Le nom de ce grand maître de cérémonies pourrait-il donner la clef de l'action de saint Blaise?" (*Histoire de la peinture en Italie* [1817; ed. Paris, 1966 as *Stendhal, Du romantisme dans les arts*] pp. 96, 98).

The snakebite fallacy is still repeated by Redig de Campos (*Il Giudizio Universale*, p. 54): "Alla coda di Minosse, ha sostituito un serpente che lo morde, mentre nell'*Inferno* quel personaggio non è tormentato in modo visibile."

But the assumption that Michelangelo must have followed the Dantean text leads to strange twistings. Hauchecorne (1783), having noticed that the punishment suffered by Michelangelo's corner figure is inadmissible for an infernal judge, decides that the artist changed course in midstream: "Michel-Ange avoit bien l'intention d'en faire un [Minos], mais un ressentiment particulier changea son execution" (*Vie de Michel-Ange*, p. 185f.). The reasoning here runs as follows: Michelangelo must have used Dante's description of Minos, for how could he not, given the authority of Vasari and Varchi? At the same time, Vasari informs us that Michelangelo's Minos served his revenge upon

Biagio da Cesena, in consequence of which the figure no longer corresponds to its Dantean model. Ergo, the artist's intention to use Dante's model as appropriate to the Last Judgment was overruled by a "private resentment." No wonder the Richardsons (1728), commenting on Michelangelo's substitution of a serpent for the tail prescribed by the poet, observe: "Peut-on voir rien de plus puérile?" (*Description de Plusieurs Statues, Tableaux*, . . . p. 494). By 1845 Giovanni Rosini could write, not without widsom: "ei forse avrà da primo avuto intenzione di rappresentar Minosse sull'esempio di Dante; ma dopo avergli date le sembianze di Messer Biagio da Cesena, e fattegli le orecchie d'asino, non potea più nel suo concetto rappresentare sotto quelle forme il Re più savio e più giusto dell'antica Grecia. Sarebbe lo stesso, che porre tali orecchie a Socrate, a Trajano, a Enrico IV di Francia. Se v'ha chi crede Michelangelo capace d'una simile stoltezza; non ho che replicare, e mi taccio" (*Storia della Pittura Italiana*, V [Pisa: 1845], p. 91). A century later, Grigioni had no such qualms, affirming once again that Michelangelo changed his conception of the corner figure in an access of irritation, as soon as the carping Master of Ceremonies had withdrawn: "L'artista, appena partito il suo censore, dà di piglio ai pennelli, si precipita su Minosse e in breve la trasfigura. Non è più il mitico re di Creta, non è più uno dei tre giudici dell'Inferno e l'unico di essi veduto da Dante; è Biagio da Cesena. . . . Con pochi tratti di alterazione del volto . . . ne fa uscir fuori il ritratto. . . . E' a compiere la vendetta con una testa viperina la coda diventa un viscido serpente" ("Le nudità del 'Giudizio Universale,' " p. 74). Then, vaguely conscious of the absurdity of his scenario, Grigioni concludes: "Ecco a che cosa può condurre l'ira." Here at last the "puerility" condemned by the Richardsons two hundred years earlier has reduced the extremity of the fresco to children's corner, prompting a pedagogue's warning: "Behold to what ruin bad temper can lead a great man!"

What persists through these learned comments is a subconscious determination to maintain the fresco's literary associations—those with Vasari and those with Dante. Vasari's text, being a primary source, cannot be given up, and the Dante connection is axiomatic. That Michelangelo's rendering is thereby brought down to meaningless incoherence surprises some and provokes others to reprimand; better so than to challenge the literary tradition which remains sacrosanct. Nor has more recent Michelangelo scholarship brought redress. As interest shifted to other concerns (formal analysis, Neoplatonism, and more), such trivialities as Michelangelo's want of logic in characterizing his corner-stopper simply dropped from the agenda. "Minos" continues to be designated according to literary convention, no matter how contradicted by visual evidence. We are here victimized by a habit deeply ingrained in Western culture. Within Christendom, narrative religious imagery was sanctioned originally as the "Bible of the illiterate"; the educated, those who had access to the real thing, did not need it, but might look at the artist's product to read off its fidelity to a text. That the imagery of a Michelangelo may itself be a primary document is still a hard notion for men accustomed to the reading of books. Simply to look seems somehow unworthy—seems voyeuristic, carnal, and gross, as if one were an illiterate. And a plea for serious beholding is like a demand to jettison all one has learned. Hence the inevitable resistance, and the surprise of the learned at seeing others indulge their vision of art: "Verily," recalls Peter Martyr Vermigli, "I have seen, especially at Rome, diverse images, so artificially wrought, that many men, which were skilful of those arts, spent many hours in the diligent beholding of them" (quoted in Philip McNair, *Peter Martyr in Italy* [Oxford: 1967], p. 136).

[45] Concerning the serpent's gender: In premodern Italian, the word *serpe*, like the Latin *serpens*, is usually feminine. The *Vocabulario della Crusca* (ed. 1700) quotes from Boccaccio's *Novella* 77: "Te non columba, ma velenosa serpe conoscendo" ("I know thee to be not a dove, but a poisonous snake"). *La serpe* is feminine again in the *Inferno* XXV. 4, as it is in the proverbial "allevarsi la serpe in seno." Our Pasquino sonnet describes the reptile in the fresco's lower right corner as "una serpe." The serpent that tempted Eve—masculine in the original Hebrew and thereafter in St. Augustine (*coluber: City of God*, xiv. 11) and Milton ("The infernal serpent, he it was")—appears as the feminine *serpens* in the Vulgate; and Eve's tempter is rendered with female characteristics in medieval and Renaissance art, including Michelangelo's Sistine Chapel fresco of the *Temptation*.

[46] See L. Steinberg, "The Line of Fate in Michelangelo's Painting," *Critical Inquiry*, 6 (Spring 1980), p. 431, for a fuller treatment of this observation.

[47] St. Augustine, *City of God*, xxii. 17: "the death of Christ, whose side, as He hung lifeless upon the cross, was pierced with a spear, and there flowed from it blood and water, and these we know to be the sacraments by which the Church is 'built up.' "

[48] Heinrich Wölfflin, *Die Klassische Kunst*, 7th ed. (Munich: 1924), p. 197.

[49] Condivi: "e colla sinistra distesa alla parte destra, par che dolcemente raccolga i buoni" (Ascanio Condivi, *Vita di Michelangelo Buonarroti* [1553; ed. Rome: 1853], p. 73).

[50] Luca Signorelli's contract of 1499 for the frescoes in the Brizio Chapel, Orvieto Cathedral, contains the interesting stipulation that the master himself paint the figures from the waist up; presumably anybody could do the rest: "The said master Luca is bound and promises to paint all the figures to be done on the said vault, and especially the faces and all the parts of the figures from the middle of each figure upwards"; quoted in M. Baxandall, *Painting and Experience in Fifteenth Century Italy* (Oxford: 1972), p. 23.

[51] "Jeder sittliche Ausdruck gehört nur dem obern Teil des Körpers an" (Goethe, "Über Leonardo da Vinci Abendmahl zu Mailand," 1817).

[52] The integration of the fresco with the architecture of the Sistine Chapel, a subject involving some of Michelangelo's most daring inventions, is beyond the scope of the present paper. The received notion, which takes the *Last Judgment* to be its own illusionist system regardless of the given architectural space, is, I believe, profoundly mistaken.

[53] An outstanding characteristic of the figures in the *Last Judgment* is the coincidence they display of individuation and subordination. This synthesis of contrary tendencies, first exemplified in Leonardo's *Last Supper*, is here raised to a power that defeats all attempts at description. Writers, accordingly, focus on one or the other aspect. From the mid-sixteenth century onward, the fresco was read figure by figure or group by group. Twentieth century literature, on the other hand, tends to stress larger abstract or compositional functions. Individual figures begin to recede behind forms of organization. One can pursue a literary tradition evolving from such rhetorical overstatements as Wölfflin's (1898): "Nothing counts individually, all is concentrated on the grouping of masses" (*Die Klassische Kunst*, p. 197). Thereafter, the literary momentum grows irresistible. For Max Dvořak (1918-1919), the figures within the fresco merely give evidence of "a force whose direction all these giants must follow, as disturbed dust follows the wind"; Panofsky compares the depicted groups to "iron filings in a magnetic field"; Neumeyer (1929) sees the individual forms giving way to "mutally interwoven form-clusters . . . attached to power streams that lie outside themselves"; in Dagobert Frey's summary of the master's late style (1920), "all is motion, but it is not matter from which motion proceeds by extension, rather space itself is re-interpreted as a phenomenon of mobility" (Max Dvořak, *Geschichte der italienischen Kunst im Zeitalter der Renaissance* [1918-1919], II [Munich: 1929], p. 128; Erwin Panofsky, unpublished lectures on Michelangelo, Institute of Fine Arts, New York University, 1938; Alfred Neumeyer, "Michelangelos Fresken in der Cappella Paolina des Vatikan," *Zeitschrift der bildenden Kunst, 63* (1929-1930): 173; Dagobert Frey, *Michelangelo-Studien* [Vienna: 1920], p. 143). Hans Tietze's admirable essay of 1926 states the case—and the distortion implicit in it—with perfect clarity: "The individual figure melts into the group, the whole composition works with masses; on the Day of Judgment whatever is individual is stripped away. This ultimate equalization *(Gleichmachung)* of all mankind is physically sustained by nudity which reveals whatever is hidden, and by the equal corporeal maturity of all, justified by the theological doctrine that the bodies arise in full flower. More relentless still is their ideological equalization" ("Michelangelos Jüngstes Gericht und die Nachwelt," p. 432). Here the pendulum of opinion has completed its swing, arriving at palpable falsehood: as if Michelangelo must produce either a concatenation of individuals or dummies driven by impersonal forces. The generation of Tietze actually sought to discourage us from perceiving the astonishing particularity of each participant character, suppressing the fact that the fresco adduces men of most varied types and ages and women from shining youth to anility (as in the topmost crone at upper left) and that every one of these hundreds of figures has its own physiognomy, performs its own unrepeatable gesture, acts or reacts like no other.

[54] The identification of the cave as Limbo was idly proposed by Tolnay (V, p. 43). Its identification as Purgatory is due to G. A. Guattani (*Memorie enciclopediche sulle belle arti, antichità, etc.* [Rome: 1806-1816]), from whom it was picked up by Stendhal, who established it as canonic for subsequent writers in French. In a footnote, wherein he modestly disclaims theological competence, Stendhal proposes that those souls in Purgatory whose purification was prematurely interrupted by Doomsday might be relocated in Hell: "Le Purgatoire étant supprimé, peut-être les âmes qui ne sont pas assez épurées vont-elles en enfer" (*Historie de la peinture en Italie*, p. 100 n. 29). Stendhal is echoed by Delacroix (1830): "Cependant le purgatoire se vide, puisque tous ceux qu'on y tourmentait s'en vont chercher leur sentence définitive et les diables furieux y sont réduits à grincer des dents et à se tourmenter eux-mêmes" (Delacroix, *Oeuvres Littéraires*, p. 47). Romain Rolland (1905) follows: "At the left the bodies rise heavily from Purgatory like inflated balloons drawn up by the sun" (*Michelangelo*, ed. 1915, p. 94). Redig de Campos in *Il Giudizio Universale* abstains from identifying the cave, declaring only that Steinmann and others were wrong to call it the mouth of Hell, since Hell is indicated in the lower right corner (p. 35, n. 1).

[55] Michelangelo even includes a hobgoblin prizing his cheeks apart with hooked forefingers—a discreet nod to a devil between Satan's legs similarly engaged in Giotto's *Last Judgment* at Padua.

[56] Tolnay (V, pp. 98-99) rightly questioned the notion (repeated by Steinmann, Biagetti, Feldhusen, and others) that approximately one meter at the bottom of the original fresco has been destroyed. This supposed mutilation is assigned to the years 1572-1585, when, under Gregory XIII, the altar platform was raised by 45 cm. (not one meter!). But there is no evidence that the raising of the altar platform necessitated raising the dado into the field of the fresco. As Tolnay saw, the misapprehension arose from regarding Marcello Venusti's painting in Naples as the earliest copy extant and as authoritative. In fact, the bare ground at the bottom of Venusti's painting is a programmatic addition that has nothing to do with the state of the original at any time. Meanwhile, scholars have unaccountably ignored the more important evidence of Della Casa's engraving of 1543, which predates Venusti's copy by six years. Here the base of the composition across three

quarters of its extent corresponds substantially with the present state of the fresco. But at the extreme right Della Casa raised the last group of figures to allow a patch of bare ground between them and the lower margin. The effect is to expand the infernal acres which the painter had underscaled. It is the first sign of the "corrective" trend that was to grow bolder in succeeding copies.

[57] Two further "corrective" changes in the Della Casa engraving deserve notice: in the fresco, the central cave, afire within, is obviously closed at back, its interior blaze forming a vivid contrast to the blue water at right. In the engraving, the level striation that signifies water is prolonged through the cave's interior, which thus appears to have no back wall, allowing access from the rear. (Later copyists preferred the more radical course of retracting hellmouth so as to make it accessible from the front.) The other change in Della Casa's print is equally telling, the more so since his engraving is in general the most accurate among sixteenth century copies. He has made the central cave tangent with the stern of Charon's barque, where the master had taken pains to keep them apart.

[58] Stendhal, *Histoire de la peinture en Italie*, p. 100.

[59] Steinmann, *Die Sixtinische Kapelle*, p. 548; Feldhusen, *Ikonologische Studien*, p. 31.

[60] Catherine of Genoa (1447-1510), in her so-called treatise *On Purgation and Purgatory*, ch. VII; see *Late Medieval Mysticism*, Ray C. Petry (ed.), The Library of Christian Classics, XIII (Philadelphia: n.d.), p. 404.

[61] See Friedrich Gorissen, *Das Stundenbuch der Katherine von Kleve. Analyse und Kommentar* (Berlin: 1973), p. 433. To put the matter beyond doubt, certain representations of the Mass of St. Gregory (e.g., two engravings by the fifteenth century Master IAM of Zwolle, Lehrs 20, 21, cited by Gorissen, p. 435) show St. Gregory's altar flanked by a miniature representation of souls in Purgatory.

[62] *The Canons and Decrees of the Sacred and Oecumenical Council of Trent*, J. Waterworth (tr.) (London: 1848), p. 233. The dogma of Purgatory had been defined at the Councils of Lyons (1274) and Florence (1439).

[63] See Sadoleto's letter to Cardinal Cortese in R. M. Douglas, *Jacopo Sadoleto* (Cambridge, Mass.: 1959), p. 196. For the Protestant counterclaims, cf. Luther's *Thesis* 15 (1517): "This fear and dread are enough in themselves . . . to constitute the penalty of purgatory, for they are very close to desperation's terror." In his *Explanations of the Ninety-Five Theses* (1518) he writes: "I do not know where the place of purgatory is, even though St. Thomas thinks it is beneath the earth. Meanwhile, I remain in agreement with St. Augustine, namely, in the belief that the places of refuge for souls are hidden and so obscure that we know nothing about them" (Harold J. Grimm [ed.], *Career of the Reformer* [Philadelphia: 1957], I, p. 115). Where Luther spiritualized Purgatory into the soul's state of dread, the other Reformers denied its existence outright. Thus, Zwingli's *Sixty-Seven Articles of January 19, 1523*, articles 57 and 58: "Genuine Holy Writ knows no purgatory after this life (57). The fate of the departed is known only to God" (58). More emphatically, Calvin (in his famous response to Sadoleto and again in the *Institutes*) calls Purgatory, among other things, "a deadly fiction of Satan . . . a dreadful blasphemy against Christ" (*Institutes of the Christian Religion*, III, 5.6.; F. L. Battles [tr.], The Library of Christian Classics, XX [Philadelphia: 1960], I, pp. 675-6).

In late 1540 Camillo Renato, tried for heresy at Ferrara, was accused of holding that "souls expire at the death of the body and have no abiding place until the resurrection and the Last Judgment; and hence that all the liturgical and penitential practices based on the alleged existence of a Purgatory . . . are not only religious deception but also the occasion for an intolerable social exploitation by the professionally religious"; see George H. Williams, *The Radical Reformation* (Philadelphia: 1962), p. 548. At the same time, Peter Martyr Vermigli, preaching in Naples under the influence of Valdes, was charged with having denied the Roman Church doctrine on Purgatory; see McNair, *Peter Martyr in Italy*, p. 161. Four years later the denial of Purgatory was one of the charges of heresy brought against the same Bishop Pier Paolo Vergerio who smuggled the writings of Valdes out of Italy for publication in Basle (1550).

Some indication of how Purgatory was viewed in Valdes's circle in Naples emerges from Carnesecchi's confession at his trial for heresy in 1566. He reports that while in Naples in 1540, as a member of Valdes's circle, he had begun to doubt Purgatory ("credo che cominciassi sino a Napoli nel 1540 a dubitare del purgatorio"); that the poet Marcantonio Flaminio, a fellow Valdesian, had pointed out to him a passage in St. Augustine's *Commentary on the Psalms* where it was said "it can be wondered whether there is a third place in addition to heaven and hell, showing by these words that even he was not sure about it [purgatory]"; quoted in G. Manzoni, *Estratto del processo di Pietro Carnesecchi* (Turin: 1870), p. 195.

[64] Among the loyal, reform-minded Italian Catholics, the opposition to the un-Scriptural doctrine of Purgatory took the form of a lapse by omission. Tacitly, yet inevitably, it was suppressed by their zeal to reestablish Christianity in accord with the teachings of the early Fathers—"cutting back to that root and freeing church and creed of what they regarded as the suffocating growth of ecclesiastical tradition and magisterial prerogative" (G. H. Williams, *Spiritual and Anabaptist Writers* [Philadelphia: 1957], p. 22). Again, it is Carnesecchi at his heresy trial who presents the situation most clearly: "I was persuaded by Valdes and his other supporters such as Fra Bernardino [Ochino] and Flaminio that the aforesaid opinions [on Justification and Assurance of Grace] were good and Catholic, but indeed without then making any of those deductions which I later knew could be

made from such principles—I mean, that the sacrament of penance was not necessary, nor contrition, nor satisfaction for recovering Grace lost by mortal sin, nor was it necessary to purge the guilt of our sins a second time in Purgatory, Christ by His death having made abundant satisfaction for all, as he [Valdes] used to say" (quoted in McNair, *Peter Martyr in Italy*, p. 48).

Of those Reformers who rejected Purgatory yet abstained from an open declaration, Calvin wrote in disdain: "I do not agree with certain persons who think that one ought to dissemble on this point, and make no mention of purgatory" (*Institutes of the Christian Religion*, III, 5.6, p. 676).

[65] See G. R. Ceriello's *Michelangelo Buonarroti: Rime* (Milan: 1954), p. 254, commentary to no. 88.

[66] The omission of Purgatory in Michelangelo's writing was first noted by Grimm: "Keine Spur in seinen Versen von Fegefeuer. Dergleichen fällt ihm gar nicht in die Gedanken" (Herman Grimm, *Leben Michelangelos* [1860; ed. Vienna: n.d.], p. 584).

[67] In the *Revelations* of St. Bridget (VI. 52; ed. Oxford: 1929, p. 113) "the woman in purgatory" declaims: "But when death came . . . then the soul saw and knew itself that it was naked, for few of my deeds were good, and my sins were many. And for shame I might not stand in the palace of the endless king of bliss, for I was shamefully clothed. But then devils drove me into hard pain, where I was scorned with shame and confusion." Describing her deathbed repentance, the woman in purgatory continues: "And in that point of time was there kindled in my heart a spark of charity, by which the passion of Christ seemed more bitter to me than my own death. And so then broke my heart, and my soul came into the hands and power of devils . . . for it was not worthy that the angels of fairness should come near the soul of so much foulness. But in the doom of God, when the devils cried and asked that my soul should be . . . damned into Hell, the Judge answered: 'I see, he saith, a spark of charity in the heart which oweth not to be quenched, but it must be in my sight. Therefore I deem the soul unto purgation, unto the time that it be so worthily purged and made clean that it deserve and have forgiveness.' "

[68] The *Limbus infantium* was reserved for unbaptized children who died in Original Sin, though innocent of actual sin; the *Limbus patrum* was designed originally for the saints of the Old Testament but was later opened to pagan worthies.

[69] The first attempt in the Michelangelo literature to assign significance to the unprecedented collocation of hellmouth and altar occurs in Ruth Feldhusen's 1953 dissertation. But the usefulness of her insight is diminished by her insistence on the exclusive relevance of the Office of the Dead.

[70] *The Enchiridion of Erasmus*, Raymond Himelick (tr.) (Bloomington, Indiana: 1963), p. 176.

[71] Marcia B. Hall, "Michelangelo's *Last Judgment:* Resurrection of the Body and Predestination," *The Art Bulletin* 58 (1976): 85 n. 1, referring to my "Merciful Heresy."

[72] The two outstanding expressions of Evangelism usually cited in the literature are the *Consilium de emendanda ecclesia* (1537); English translation in John C. Olin, *The Catholic Reformation: Savonarola to Ignatius Loyola* (New York: 1969), pp. 182-97; and the *Beneficio di Cristo* by Benedetto da Mantova and Marcantonio Flaminio, copies of which were so thoroughly rounded up and burned by the Inquisition that the text was not rediscovered until 1855, when a copy was located in St. John's College Library, Cambridge. In the large literature that has lately grown up on the subject of the Italian Reform movement, the relevance of Michelangelo's fresco has not yet been recognized.

[73] To the modern reader, Cardinal Cajetan's expressed doubts about the materiality of hellfire will seem tame enough. In their day they were exceedingly nervy. Naturally, given the overriding requirement to derive all true propositions from the revealed truth of Scripture, Cajetan's argument proceeds from a textual analysis of Christ's words in Matthew 25:41: "Depart from me ye cursed into everlasting fire." He then argues as follows: "Whether the fire of hell is corporeal has not been established by any certain definition of the faith. Yet we believe that rationally speaking it is corporeal, because the Scripture calls it fire, and, generally speaking, there is no obstacle to understanding it as fire, if indeed nothing contradictory follows [therefrom]" (*In iiij Evangelis* [Lyons: 1558], p. 138v). But then Cajetan quotes the rest of Christ's sentence: " 'Which has been prepared for the devil and his angels.' Here it appears that this same fire has been prepared for wicked men and wicked angels, and that it constitutes the same punishment for both. And for this reason difficulties arise as to the actual nature of that punishment. For a corporeal fire cannot afflict the devil and his angels, whose substance is incorruptible" (Ibid., p. 139r).

Cajetan's writings were the subject of a substantial diatribe by the orthodox zealot of his own Dominican Order, Ambrogius Catharinus. Prevented at first from publishing his *Annotationes in Commentaria Caietani*, he received clearance from the Sorbonne to publish the work in 1535, after Cajetan's death, and again in a second edition in 1542. Catharinus, who elsewhere inveighs against Vittoria Colonna's circle of the *Spirituali*, takes Cajetan to task for his "two hundred and eight errors," among them the cardinal's reservations about hell's materiality: "And I have wondered at [the fact] that he says first that the eternal fire into which the Lord hurls condemned souls into judgment is corporeal because the scripture calls it fire, and he has no obstacle in understanding it as such, but yet a little further along he says that this fire is prepared for the devil and his angels who cannot suffer from that fire. . . . I have pointed out these things not so that I might find an answer to the question but so that I might demonstrate the inconsistency of the doctor" (*Annotationes in Commentaria Caietani* [Lyons: 1542], p. 139). On Catharinus, see Friedrich Lauchert, *Die Italienischen*

Literarischen Gegner Luthers (Freiburg im Breisgau: 1912), pp. 30-133; and, more recently, for Catharinus's role in the Counter-Reformation, Dermot Fenlon, *Heresy and Obedience in Tridentine Italy. Cardinal Pole and the Counter Reformation* (Cambridge: 1972), pp. 87-88.

[74] In the list of charges drawn up by the Inquisition against Valdes, Pole, Morone, Priuli, Flaminio, Vittoria Colonna, Soranzo, Sanfelice, Carnesecchi, and others, Cardinal Pole received four times as much, and Vittoria Colonna twice as much space as the rest; see Fenlon, p. 279.

[75] For the first quote from Valdes, see Benjamin B. Wiffen, *The Life and Writings of Juan de Valdes . . . with a Translation of his Hundred and Ten Considerations* (London: 1865), p. 307. The second passage, from Valdes's *Consideration* 87, is quoted in Williams, *The Radical Reformation*, p. 532.

[76] Eva-Maria Jung, "On the Nature of Evangelism in Sixteenth Century Italy," *Journal of the History of Ideas* 14 (1953): 527.

[77] For the allegorical status of these figures, see "Merciful Heresy," p. 53.

[78] References for the above quotations: Pastor, *The History of the Popes*, XII, 628; Panofsky, unpublished lectures (see above, n. 53); Millard Meiss, *Painting in Florence and Siena after the Black Death* (Princeton: 1951), p. 77.

[79] Redig de Campos, *Il Giudizio Universale*, p. 43. Here the condemnatory zeal of the art historian exceeds that of Michelangelo and Christ combined. The faces of the condemned in the barque include several of perfect and noble calm.

[80] One colleague, fearing overinterpretation, suggests that the incident in the barque merely dramatizes the hopelessness of resistance, importing no more than the pathos of it. But there is a difference between hopeless self-defense and selfless resistance on behalf of a friend. We shall not get closer to Michelangelo's thought by submerging its particularity in a large, misty class such as "pathos." Another scholar, hoping to save the artist for orthodoxy, declares the youth's reach for his friend to be ambiguous; he could be "trying to push him out." This is polemically effective, for it forces one into the mean role of spelling out the physical details of hand grip, body thrust, and so on, and of telling a colleague to look again.

Incidentally, the youth's impulse of charity does not lend itself to a Catholic argument in favor of works as against faith. If the youth in the barque is performing an act of charity, his action, in Catholic terms, could win him merit toward salvation; in Protestant terms, his manifest charity would be not the cause but the result of grace.

[81] St. Thomas Aquinas, *Summa Contra Gentiles*, IV. 93, ed. Charles J. O'Neil (Notre Dame: 1975), pp. 341-2. Cf. also St. Catherine of Genoa, quoted p. 243 above.

[82] Petrus Reginaldetus, *Speculum finalis retributionis* (Basle: 1499), sig. c5.

[83] The sermon in Joyce's *Portrait* is profoundly orthodox; so is Sartre's *No Exit*, with its revelatory line, "Hell is other people."

[84] Catherine of Genoa, *On Purgatory and Purgation*, ch. III (*Late Medieval Mysticism*, p. 402).

[85] Two doubting colleagues have independently cited the case of Paolo and Francesca in the 5th Canto of Dante's *Inferno* to prove that in the Catholic imagination moral nature could survive even in Hell—witness Francesca's abiding love. This argument is surely a romantic modern misreading of Dante's intent. What survives in Francesca is not charity but precisely that erotic passion which led her to drift into adultery and consequent death. And the two lovers suffer together because, in Dante's words, they died "one death." That lovers in Hell remain joined in penalty is a matter of poetic justice: in a sixteenth century Serbian *Last Judgment*, a young couple who made love on Sunday instead of going to church are found in Hell writhing forever on a fiery pallet; see D. Milošević, *Das Jüngste Gericht* (Recklinghausen: 1963), p. 63.

[86] One man who noticed the misdirection of Charon's oar in Michelangelo's fresco is Gustave Doré. Illustrating the *Divine Comedy* (ca. 1870), he adopted the Michelangelo figure in the context of the *embarkation*, so that the swing of the oar became functional in Dante's terms.

[87] Professor Marcia Hall of Temple University tried to assure me that the silent bugler is no *explanandum*, since the angels of the Apocalypse, with whom she identifies Michelangelo's brass band (cf. p. 211), do not, according to Scripture, sound their trumpets in concert. But Michelangelo's band of eight (the number traditionally associated with rebirth or resurrection) are unequal to the seven Apocalyptic angels of whom no two, let alone six, blow their instruments at the same time, but rather one by one, and with a different cataclysm attending each blast. None of this relates to the fresco.

The rare references to the two idling trumpeters in the Michelangelo literature reveal the undisciplined state of our field. The only accurate accounts of what is actually represented appeared in the nineteenth century, of which the first was published in 1860 in a once famous masterpiece, now rarely read—Herman Grimm's *Leben Michelangelos* (ed. cit., p. 543): "Nach allen Richtungen hin strecken sich die Posaunen aus, nur nach der Rechten nicht, wo dicht neben ihnen herab die Verdammten niedergerissen werden. Von den beiden Engeln, die dort hinausblasen sollten, hat der eine die Posaune über die Schultern gelegt und blickt mit erschreckter Neugier dem Sturze der Unseligen nach, während der andere mit der Posaune an den Lippen fragend den Kopf abwendet, als hätte er den Befehl eben empfangen, den Atem zurückzuhalten." The second, equally precise description is found in Chapon's generally misguided essay of 1892 (pp. 61-62): "Au milieu de l'espace, assombri par des nuages orageux, apparaissent onze anges d'une beauté et d'une puissance incomparables. Huit, placés deux à deux, sont au quatre points cardinaux; six sonnent énergiquement de la trompette, pour réveiller les morts. . . . Deux se reposent: l'un, son instrument gigantesque sur l'épaule, regarde le châtiment des réprouvés; l'autre pose le sien pour concentrer à son oreille les clameurs assourdissantes des maudits."

So much for the nineteenth century. It is followed by a dark age of defective vision. One modern author, observing the two idling trumpeters, notes that the elder, whose trumpet rests on his shoulder, points to the field of the Resurrection, and that his cadet seems eager to blow toward the damned. He interprets these observations as follows: while the younger angel is about to blow in the wrong direction, his elder corrects him by indicating the whereabouts of the dead who are to be rousted out of their sleep ("Not that way, stupid, they're over here!"). Michelangelo, then, would have invented an incident involving a seraphic half-wit who can't tell left from right, or the quick from the dead.

Redig de Campos's description (*Il Giudizio Universale,* p. 34) betrays total perplexity. His problem is to describe a group of eleven figures—eight trumpeters and three holders of books. He begins by calling the group "twelve giant angels" and promptly loses count, citing one with the little book of the elect few, two with the large "book of perdition," six who sound their apocalyptic trumpets, and "a seventh," who rests his instrument on his shoulder "e chiama i morti a gran voce"; which adds up to ten. The suggestion that the last-mentioned angel "calls the dead with loud voice" is irresponsible.

In my own reading, the younger angel is impatient to recall the condemned—and looks for a signal from the keeper of their moral conscience. The elder angel—who is not shouting to rouse the dead, but gazing down at the sufferers as he points to the Resurrection—conveys a message of hope.

[88] See *The Catechism of the Council of Trent* (1566; Manila [ed.]: 1974, p. 85): "Their eternal banishment from the sight of God [is] unrelieved by one consolatory hope." Cf. St. Augustine, *City of God,* XIX, 28: "in the world to come the pain continues that it may torment, and the nature endures that it may be sensible of it, and neither ceases to exist, lest punishment also should cease." Cf. also St. Thomas, for whom the eternal duration of punishment is a requirement of cosmic symmetry, to balance the boon of eternal bliss. "Punishments are not inflicted by God for their own sake . . . but for the imposing of order on creatures, in which order the good of the universe consists. Now, this order demands that all things be divinely arranged in a proportionate way. . . . Just as rewards are in proportional correspondence with the acts of the virtues, so are punishments with sins. And to some sins are proportioned eternal punishments . . . so that due order may be observed in things, which order manifests His wisdom" (*Summa contra Gentiles,* III, 144, 10).

[89] The friendship theme in Michelangelo's fresco is too large for more than a few cursory hints. Announced in the lowermost zone among the resurrected as well as the condemned, it becomes increasingly dominant in the ascent of the rising souls and throughout the heavenly choirs. It culminates among the angels in the lunettes, of whom a half dozen, though fully occupied about the instruments of the Passion, embrace one another. This latter notion of the mutual love of the angels is persistent in Michelangelo's work. Its textual basis appears to be Cistercian. Thus, St. Bernard's friend Aelred of Rievaulx in his treatise *Spiritual Friendship,* I, 53-56 (Mary E. Laker (tr.) [Washington, D.C.: 1974], pp. 62-63): "He has willed . . . that peace encompass all his creatures and society unite them; and thus all creatures obtain from him, who is supremely and purely one, some trace of that unity. For that reason he has left no type of beings alone. . . . What soil or what river produces one single stone of one kind? Or what forest bears but a single tree of a single kind? And so even in inanimate nature a certain love of companionship, so to speak, is apparent, . . . And surely in animate life who can easily describe how clear the picture of friendship is, and the image of society and love? . . . For the angels too divine Wisdom provided, in that he created not one but many. Among them pleasant companionship and delightful love created the same will, the same desire. Assuredly, since one seemed to be superior, the other inferior, there would have been occasion for envy, had not the charity of friendship prevented it. Their multitude thus excluded solitude, and the bond of charity among many increased their mutual happiness." Cf. Milton's *Paradise Lost,* VIII, 612-29, where Adam indiscreetly questions the angel:

> Love not the heav'nly spirits, and how their love
> Express they, by looks only, or do they mix
> Irradiance, virtue or immediate touch?
> To whom the angel with a smile that glow'd
> Celestial rosy red, love's proper hue,
> Answer'd. Let it suffice thee that thou know'st
> Us happy, and without love no happiness.

It is a pleasure here to acknowledge the *amicitia* of two dear friends: the Aelred text was pointed out to me by Francine du Plessix Gray; the Milton passage, by John Hollander.

[90] The two books in the fresco are unique to Michelangelo's interpretation of the subject. Their meaning—which has nothing to do with any statistical differential between the many rejected and

the chosen few—is discussed in "Merciful Heresy," p. 56 and nn. 21, 22. That the large book held open toward the condemned symbolizes awareness of sin seems almost self-evident. St. Augustine describes the open book at the Last Judgment as "a certain divine power, by which it shall be brought about that every one shall recall to memory all his own works, whether good or evil, and shall mentally survey them with a marvelous rapidity, so that this knowledge will either accuse or excuse conscience, and thus all and each shall be simultaneously judged. And this divine power is called a book, because in it we shall, as it were, read all that it causes us to remember" (*City of God*, XX, 14). Cf. J. N. D. Kelly summarizing St. Ambrose's view: "Ambrose's conception of the judgment as taking place in the sinner's own conscience and as the result of God's knowledge of the heart reflects the influence of Greek thought. So does his idea that the . . . open books symbolize our consciousness of guilt" (*Early Christian Doctrines* [New York: 1958], p. 481). Cf. also St. Thomas Aquinas (*Summa Theologica*, Suppl. Q. 87, art. 1), for whom the book spoken of in Revelations "signifies each one's conscience, which is said to be one single book, because the one Divine power will cause all to recall their deeds, and this energy, in so far as it reminds a man of his deeds, is called the *book of life*. . . ." It remains to recall that a short tract by Valdes (published 1545) uses the phrase "proprio libro" for personal conscience; the title begins *In che maniera il cristiano ha da studiare nel suo proprio libro*.

[91] I wish to express my gratitude and appreciation to Mr. Jack Greenstein, of the University of Pennsylvania, for pointing out the anomalous treatment of St. Lawrence's grille and its tangency with the foot of the Madonna. Needless to say, the fresco's defective gridiron is frequently rectified in the copies by the addition of supporting legs or extra mullions; e.g., Martino Rota's engraving, the paintings by Le Voyer and Hans Mielich, the stipple engraving by Conrad Martin Metz (1745-1827), and so on.

Notes on Contributors

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